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# Contractors and Engineers Monthly


Vol. 48, No. 7 JULY, 1951 $4 a Year, 50 Cents a Copy



LIBRARY CURRENT SERIAL RECORD JUL 18 1951 U. S. DEPARTMENT OF AGRICULTURE

*C. & E. M. Photo*

**Eighty-two big RC piers, 50 feet deep in places, underlie the Niagara Mohawk Power Corp. steam power station near Albany, N. Y. (page 30). Here a turbine-room pier is stripped.**

**• Cherish Your Excavators**

Especially now, in the face of an equipment shortage. Page 3 offers reminders on preventive maintenance.

**• Bituminous Paving**

Of a 24-mile access road to the H-bomb plant in S. C. Page 5.

Of a 14½-mile secondary road in New Mexico, by road-mix. Page 82.

**• New Tunneling Method**

It's a Swedish import which uses light drills and a light movable platform; it's speeding Rattlesnake Tunnel. Page 11.

**• War on Billboards**

California's Chief Right-of-Way Agent waging the war to keep freeways from becoming "billboard alleys". Page 17.

## Covering the Field

**• Power Plant**

Eighty-two concrete piers support it (see page 20). The nearby Hudson River necessitated wellpointing.

**• Detroit Expressways**

A typical contract on a section of dual concrete pavements, laid on a sand-gravel base, is covered on page 24.

**• School, Mill, and Dome**

The school is for 7th and 8th graders (page 30), the mill is for U. S. Steel (page 75), and the dome is for a Festival of Britain exhibit building (page 90).

**• Grade Separations**

As described on page 34, a pneumatic mandrel drove cast-in-place piles for the expressway structures.

**• Pine Flat Dam**

Fifty-degree concrete is going into the starting blocks of the dam across Kings River in California. Page 38.

**• Portrait in Print**

Small and medium-sized jobs are as welcome as the big ones, to this contractor with 700 employees on his payroll. Turn to page 47.

**• Maintenance in Desert**

Annealing, upper-decking, armor coating are some bituminous tricks page 53 reports. Everything is mechanized.

**• Dealer With a Future**

It's the McCoy Co., and its plant, people, and policies are described on page 58. There are pictures too.

**• Railroad Grading**

Major RR construction isn't over in the U. S.: witness a 71-mile C. B. & Q. cutoff a-building in Missouri. Page 67.

**• Rubber-Asphalt Roads**

Massachusetts did some experimenting last year, resurfacing 40 miles with a rubber-asphalt mix. See page 72.


*(You will find "In This Issue" on page 4)*

# NEWS AND VIEWS

*of the construction industry — volume and trends, wartime restrictions, material shortages*

Industry was generally mute and uncomplaining when NPA announced its Controlled Materials Plan. Everyone had expected it for a long time and, despite a shudder at the paperwork involved, had almost hoped for it. But shudders turned to howls when, practically at the same time, **NPA amended Order M-4** and added to the already long list of projects that need authorization (1) multi-unit housing over three stories, (2) single-family residences costing over $35,000, and as a final catch-all (3) projects using 25 tons or more of steel. (See C. & E. M., June, 1951, pg. 4.)

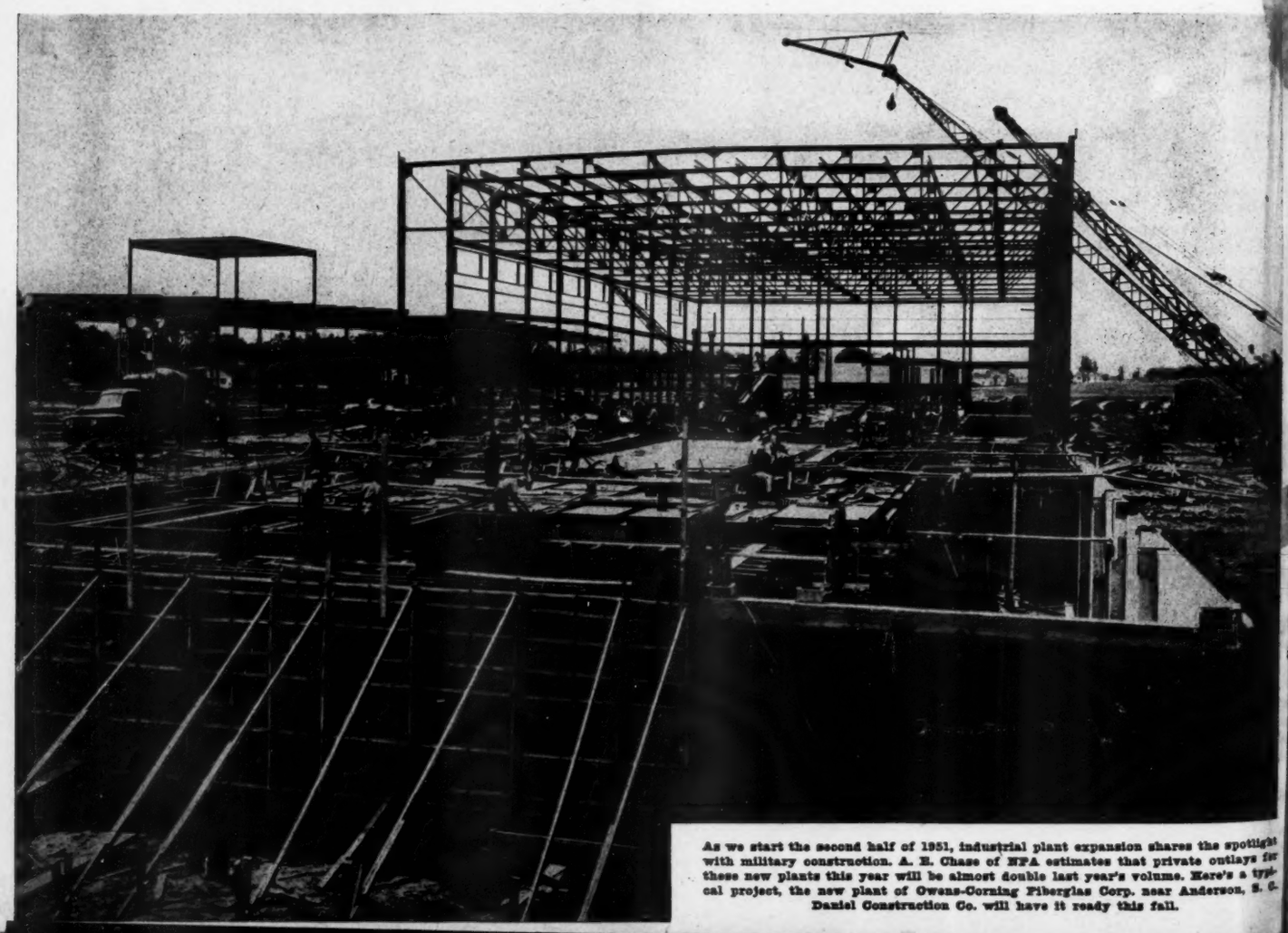
More than the order itself, **perhaps it was the way of issuing it that evoked the howls:** members of the Construction Industry Advisory Committee were called to their sole conference on the order May 3—to find it an accomplished fact, dated May 3. The cries of protest were lusty and ranged from "Unnecessary restrictions!" to "Chaos in the construction industry!" to "Death knell for public and private building!"

At this writing, the amended order has not been fully clarified, but more moderate appraisals of its effects can already be heard. Take highway construction. **The ARBA is fairly confident that there will be no stop-order in highway construction.** It expects an NPA directive giving the Bureau of Public Roads authority to administer construction controls as they affect highways. And it expects an over-all allotment of road steel to the Bureau for the third quarter of this year. The Bureau will reallocate this steel to the states according to their estimated needs and will work with them to determine which projects are essential. A project approved for steel use will automatically carry a priority rating plus the authorization to commence construction as required by M-4—at least that's the plan ARBA hopes for.

**There will be less steel for roads than the nation needs**—perhaps 20 to 33 1/3 per cent less—and this will certainly curtail programs in certain areas. But the ARBA still expects a relatively high degree of activity if the allocation program goes through. It points out hopefully that the official steel allocation in June granted more steel for highway construction than for any other single use: 151,000 tons, or some 10,000 more than for the next largest consumer.

**The ARBA is not so hopeful about construction machinery,** though it is dickering with NPA here too for a definite program. And **road maintenance as well as construction will suffer** from such a shortage. (A midwest manufacturer, for example, has scores of orders for motor-grader blades to be used in maintenance and snow removal, but he cannot get steel delivery before November. His customers will be lucky to get blades before December—a little late for snow removal.) However, the ARBA consensus is that controls will "force a realignment of highway programs in several areas but will nevertheless, permit a relatively high degree of activity."

A similar prediction for construction as a whole was voiced by Arnold E. Chase at the spring meeting of The Producers' Council, where he represented the NPA. "It does not take a very long gaze into the crystal ball", he said, "to foresee **a dip in total construction activity during the last half of 1951."** The dip will result mostly from a **tapering off in the housing boom:** half-year starts were about 500,000 compared to 705,700 last year, though the goal of 850,000 starts for the year will undoubtedly be reached. (In its May issue "Fortune" really stuck its neck out by predicting 1,125,000 starts this year.) Total dollar outlays for construction in the third quarter will be about 5 per cent below a year ago, Mr. Chase said, and 15 per cent below in the fourth quarter. **By the end of the year the physical volume of work being done will have dropped 20 to 25 per cent from the pre-Korean level.** Types of construction will have shifted too. Industrial plant expansion, military construction, electric-power development, and school and hospital building will hold the spotlight and will cut in somewhat on housing, commercial building, and public works. But all in all, the ARBA prediction for highways and Mr. Chase's for construction as a whole are strikingly similar. **Realignment of programs but relatively high activity.**



**As we start the second half of 1951, industrial plant expansion shares the spotlight with military construction. A. E. Chase of NPA estimates that private outlays for these new plants this year will be almost double last year's volume. Here's a typical project, the new plant of Owens-Corning Fiberglas Corp. near Anderson, S. C. Daniel Construction Co. will have it ready this fall.**

# New Machines Scarce, So Cherish the Old

## Equipment Care Is More Than Ever Essential to Good Job Management; Here's a Starter On Shovel and Crane Care

• SEVENTY per cent of the construction equipment made this year will probably be snapped up by the Military, the National Production Authority has said. This means that contractors and highway departments will have to wait for new machines—indeed, for repair parts, too. It means they will have to take even better care than usual of the equipment already in their yards and shops, and on their jobs.

So in this and following articles we shall outline a preventive-maintenance program for several kinds of construction machinery. Of necessity these pages can only outline, suggest general maintenance steps. But for details there is no better guide than the manual each manufacturer puts out telling how to operate and care for his machine. Don't lose that manual, or ignore it. Keep it handy, refer to it. It took time and money to prepare. It can save you time and money.

### The Breaking-In Period

It seems appropriate to begin our maintenance series with power cranes, shovels, and draglines, since they function in almost every phase of construction. If you're lucky enough right now to be getting delivery on a new crane or shovel, remember that it's like a baby: its most important weeks are the early ones. Here the equipment distributor, like the pediatrician, is the person who counts. His service man is the one who must start the unit off properly, and teach you and your operators how to use and care for it.

It behooves owners to look lively at this stage, and see that a relatively permanent employee gets the instructions—preferably an equipment supervisor or chief mechanic—as well as the operator. With labor turnover what it is, an operator is likely to leave the job, taking with him the original instructions.

Getting your machine off to a good start when new is important. Now what about prolonging the natural life built into this new machine? And—even more crucial today—what about prolonging the natural life of Old Gertie, who has been serving you faithfully for several years?

### Use, Not Abuse, Your Machines

In the first place, don't let an operator take over the controls until he knows his machine, this particular machine, and has studied the manufacturer's handbook on it. He may be perfectly competent to get off one make of machine and onto an unfamiliar one, and operate it. But he may not know the approved way to operate it, or when and how to adjust it, unless he's boned up on the handbook.

It's easy for an operator to look at a big modern power shovel and pin all his faith on its brute strength, its ability to slug its way anywhere until it falls apart of old age. Only when he gets acquainted with his machine and uses the careful adjustments and close relationship of its parts will he appreciate the need for loving maintenance.

The very setup of the machine is important if it is to work without strain—and therefore with a minimum of wear. Firm level ground is the best footing, since swinging uphill is hard on swing clutches and may even affect engine lubrication. If there is no level ground to be had, make it—with fill or timbers. It's best to keep the crawlers a little high on the load side.

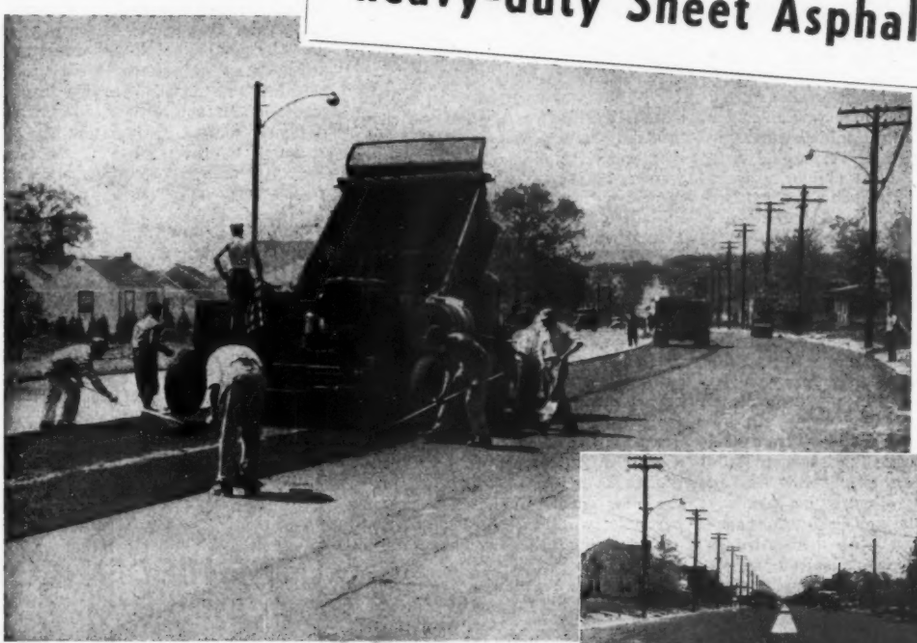
In positioning a shovel, put it close to its work to get best digging results and the most stability, but not so close that the retracting dipper will strike the crawlers or boom. As for crane and clamshell work, spot the rig so it won't have to operate at or even near the maximum safe angle.

Even with proper footing and correct positioning, there's still the matter of stability if heavy loads are to be lifted. Rubber-tired machines can lift to their maximum capacity only on outriggers, so extend and block these securely. Run a little preliminary test of stability. With the boom over the side of the crawler or rubber-mounted unit, raise the load about 3 feet off the ground. Hold it suspended and slowly lower the boom until the machine just starts to tip; then raise the boom slightly. Even if there's no indication of tipping with a load stationary, a swinging load with its centrifugal force is something else again. So test that, too. Hold your foot on the main-hoist foot brake ready to drop the load if necessary, and swing the turntable at the speed you will use

(*Continued on page 86*)


Where two important State Highways become one..

...the pavement Rhode Island laid was heavy-duty Sheet Asphalt



Constructing a 3-inch Texaco Sheet Asphalt pavement for the heavy traffic of Reservoir Avenue, Cranston, R.I. Contractor: The Campanella and Cardi Construction Company of Providence.

Two of Rhode Island's principal north-south highways are its Routes 2 and 3. South of the city of Cranston, these highways come together, sending their combined traffic over this municipality's Reservoir Avenue.

This year, the State of Rhode Island is widening a substantial portion of Reservoir Avenue to six lanes, then paving it with 114,000 square yards of Texaco Sheet Asphalt. Laid in two courses, in this case a 1½-inch binder course and 1½-inch wearing surface, this dense, resilient type of pavement successfully absorbs punishing traffic impact year after year, with a low maintenance cost. This has been demonstrated by the performance of many million square yards of Sheet Asphalt under the heaviest kind of traffic.

The 60-70 penetration asphalt used on Reservoir Avenue, like all other Texaco asphalts, is a product of carefully selected crudes. Into its refining goes the know-how gained through supplying asphalt to America's road builders for 45 years.

*A helpful booklet about Sheet Asphalt and other heavy-duty asphalt pavements of the plant-mix type may be obtained without charge or obligation by writing our nearest office.*

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**Boston 16** (20 Providence St.) • **Chicago 4** (332 So. Michigan Ave.) • **Houston 1** (720 San Jacinto St.)
**Jacksonville 2** (Hildebrandt Bldg.) • **Denver 1** (910 - 16th St.) • **Philadelphia 2** (1411 Walnut St.)
**Richmond 19, Va.** (Mutual Assurance Society Bldg.)

TEXACO

TEXACO ASPHALT

# Contractors and Engineers Monthly

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**For the Highway and Heavy-Construction Industry**

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## Our Inland Waterways

With billions being spent by the Government on defense and war, some thought might be given to allocating a small piece of this huge war chest for the completion of the inland waterway between Brownsville, Texas, and New York City. No taint of pork barrel could be attached to such a project. The many tankers sunk in shipping lanes off the Atlantic and Gulf coasts during the last war, while carrying oil from the petroleum fields of Texas and Louisiana to northeastern states, emphasize the need for such construction. This work is already long overdue.

Waterways are as important to the over-all transportation picture as highways, railroads, airlines, and pipelines. Let's face it! Our highways are still inadequate after the "holiday" from road construction during the last war. Railroads are subject to crippling strikes, or their efficiency could be seriously nullified if a few key bridges or marshaling yards were bombed. Airlines cannot handle heavy payloads for large-scale freight movements. Pipelines are necessarily limited in what they can carry. Obviously, we simply cannot afford to slight our waterways.

The Intracoastal Waterway now extends from Brownsville at the Mexican border 1,116 miles east to St. Marks, Fla. Here the 9-foot channel abruptly ends, after touching on five states in a rough arc along the protected north edge of the Gulf of Mexico. Across Florida the waterway picks up again on the eastern seaboard, with another great leg extending northward from Jacksonville 1,067 miles along the Atlantic littoral to Trenton, N. J.

While this passage ends at the Delaware River, there is another heavily traveled section connecting New York harbor and Boston through the sheltered waters of Long Island Sound. If it were not for these two gaps in the inland waterway, Brownsville and Boston would be joined by a protected "inside" water route, safe from submarines in time of war.

Completing the two remaining channel sections is no great task as public works go. The northern project would entail the extension of the New Jersey Intracoastal Waterway to New York harbor. The southern project involves the construction of the long-discussed cross-Florida canal, and the extension of the Gulf Intracoastal Waterway from St. Marks to the western terminus of the new canal. Neither job presents particularly difficult obstacles.

Concerning the development of inland waterways, it is interesting to note that the Russians are working to complete a canal linking the Baltic and the Black Seas. This canal was planned as far back as 1914 under the Czarist government. Before that, a canal big enough to float warships was dug to connect the Baltic and the Caspian Seas. Canals play a vital part in the defense and transportation system of a nation. We should not neglect the full development of our own excellent inland waterways at a time when defense and war are of paramount concern to the Government.

## "Engineers Will Play"

Engineers, like little boys, sometimes play. We caught a speech a few weeks ago that illustrates this throwback to juvenile days. This one was by a senior hydraulics engineer of a big Federal agency. Enthusiastic over hydraulics in general, he was trying to get it adopted by a sizable, important group of road builders.

Drainage structures, you know.

We felt as sorry as anybody when the guy got himself fouled up in his own equations, and had a hard time going forward or back. We got positively worried when repeated use was made of terms like "supercritical velocity", "subcritical velocity", and when the similarity was emphasized between supercritically designed pier noses and the tapered wings of supersonic aircraft.

To put it bluntly, it looked a lot to us as if this bird *liked* supercritical water velocity, and as if he was trying to get other people to like it and the fancy designing that goes with it.

Not once in the man's speech did he say anything in defense of subcritical flows. Not once did he tell those highway engineers that cooperation between their departments and land users might just spell the difference between subcritical streams and supercritical deluges. Not once did he admit that wise soil use reduces runoff figures. Instead, it was impossible to miss the eagerness in the man's voice or the light in his eyes as he said, over and over, "supercritical velocity".

We don't care how much similarity there is between supercritical hydraulic velocity and the supersonic barrier, we don't like fast water. We've seen too much of the destruction it can do. We question whether it's good engineering to train water to supercritical velocity any time that it can be avoided by other means. We doubt that supercritical-velocity designs save money when the over-all picture is considered. And by "the over-all picture" we mean the conservation of that water within the soil, instead of fancy channels to let it run to the sea.

Drainage engineers with the several highway departments have a man-sized job to do. On the whole they are doing it well. We'd hate to see them join in this play game for the fun of designing, when they're already doing a much better job working with farmers, county conservation agents, and others to reduce the input ahead of their culverts.

## How Device for Testing Concrete Was Developed

The April issue of C&E Monthly (page 23) described an instrument which measures length changes of mortar or concrete specimens to 0.0001 inch. It was built for the Portland District of the U. S. Corps of Engineers by Leupold & Stevens Instruments, Inc., Portland, Oreg. The history of the instrument has been called to our attention by J. B. Tiffany, Assistant Director of the Waterways Experiment Station in Vicksburg, Miss.

In 1946 the Concrete Research Division of the Station developed concrete-testing procedures which required a comparator that would measure specimens larger than those tested in standard vertical comparators. It finally referred the problem to the Instrumentation Branch of the Station, which designed such a comparator. The instrument has been used by the Concrete Research Division ever since and was described in the Station's 1949 "Handbook for Concrete and Cement" in Method CRD-C 25-48, "Method of Test for Length Change of Concrete and Cement".

In 1950 the Corps of Engineers concrete laboratories, including the North Pacific Division Laboratory, were instructed to obtain equipment to perform the tests described in Method CRD-C 25-48. The Waterways Experiment Station provided detailed drawings of its horizontal comparator. Some of the laboratories had the comparators built by the Station; others arranged to have them built locally. The North Pacific Division Laboratory had its comparator built by Leupold & Stevens.

## World Highway Situation Improving, Reports IRF

The economic expansion of underdeveloped countries and efforts to open up new sources of basic defense materials have increased highway construction in many parts of the world, it was reported at the annual meeting of the International Road Federation. Technical-assistance programs are placing greater emphasis on the development of highway systems, and international lending agencies are making loans for highway construction. The Economic Cooperation Administration is aiding road programs, particularly in the colonial territories of Marshall Plan countries.

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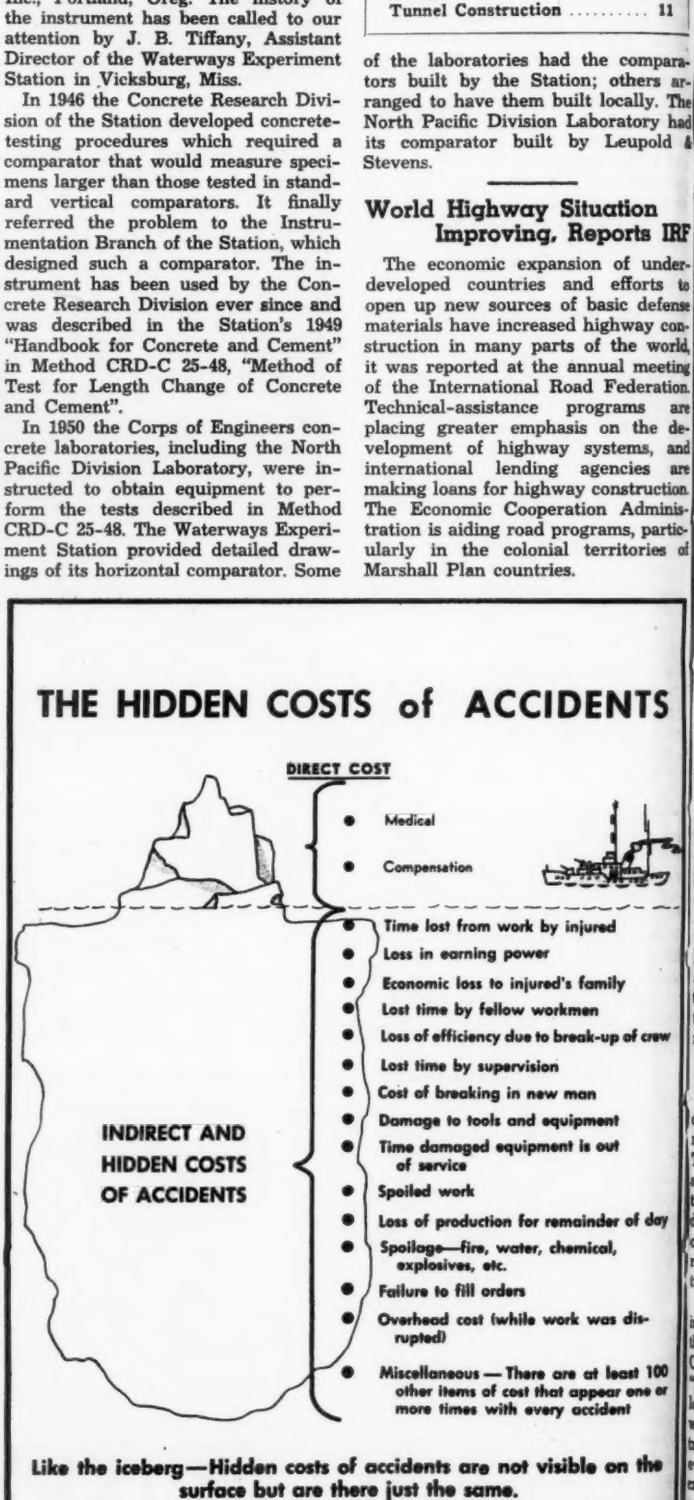
THE HIDDEN COSTS of ACCIDENTS
DIRECT COST
Medical
Compensation
INDIRECT AND HIDDEN COSTS OF ACCIDENTS
Time lost from work by injured
Loss in earning power
Economic loss to injured's family
Lost time by fellow workmen
Loss of efficiency due to break-up of crew
Lost time by supervision
Cost of breaking in new man
Damage to tools and equipment
Time damaged equipment is out of service
Spoiled work
Loss of production for remainder of day
Spoilage—fire, water, chemical, explosives, etc.
Failure to fill orders
Overhead cost (while work was disrupted)
Miscellaneous — There are at least 100 other items of cost that appear one or more times with every accident
Like the iceberg—Hidden costs of accidents are not visible on the surface but are there just the same.

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# Dual Highway Rushed To Big H-Bomb Plant

## Six-Month Deadline on 24-Mile Access Road in S. Carolina; Grading, Base Course, and Paving Carried On at Same Time

*C. & E. M. Photo*

**A fleet of Caterpillar DW10's with Caterpillar No. 10 scrapers move dirt on the Potashnick contract for the access road to the H-bomb plant near Ellenton, S. C.**

• THE fastest big job ever undertaken by the South Carolina State Highway Department was the 24.2-mile divided highway from North Augusta, S. C., to the Savannah River plant area of the U. S. Atomic Energy Commission near Ellenton. One of the reasons for the selection of the 250,000-acre plant site in Aiken and Barnwell Counties was its accessibility to population centers; this accessibility would make it unnecessary to establish a new Government community such as those at Oak Ridge, Tenn.; Los Alamos, N. Mex.; and Richland, Wash. Good-sized cities like Aiken, S. C., and Augusta, Ga., are only 15 and 20 air miles respectively from the gates of the $260,000,000 plant where tritium will be manufactured for use in hydrogen bombs. E. I. du Pont de Nemours is building the H-bomb plant.

A narrow dirt road used to wind over the hills from North Augusta, which is across the Savannah River from Augusta, Ga., to the vicinity of Ellenton. Obviously this road could not serve as an artery of transportation for the 8,000 workers to be engaged on the construction of the plant and the 6,000 permanent personnel who will work on the production of "heavy hydrogen". Nor could it be used for transporting materials and equipment for the construction and operation of the plant. A 2-lane blacktop road with the two state numbers 28 and 64 runs from Ellenton to the bridge across the Savannah River below Augusta. But its location is not favorable, and the road was neither designed nor built for traffic in weight or volume.

Accordingly, the South Carolina State Highway Department awarded a contract to R. B. Potashnick of Cape Girardeau, Mo., on his low bid of $2,038,274 to construct the access road. As a national defense project, the cost was borne by the Federal government with the State Highway Department acting as its agent in the work. Construction started the first of the year, and had to be finished by June 30. For every day over the 6-month allotted period required to finish the project, the contractor would have to forfeit $1,000. At a little over the halfway time mark, when CONTRACTORS AND ENGINEERS MONTHLY visited the job, progress was ahead of schedule, with every indication that it would be completed when the six months were up if the weather remained favorable.

### Wide, Straight Road

From its intersection with U. S. 1, connecting Aiken and Augusta, the new road follows a direct line to the plant. The countryside is rolling, but there are no steep grades or sharp curves in the alignment. Maximum cuts and fills did not exceed 40 feet. A 200-foot right-of-way was acquired to contain the roadway which measures 104 feet between ditch lines.

The project also included the widening on U. S. 1 of a 1½-mile stretch from the end of the new dual section near Clearwater on to Augusta. Other "feeder" roads around North Augusta leading to the superhighway are likewise being widened to handle future traffic. Grade-separation structures will eventually be built at the U. S. 1 crossing, and at two other locations around North Augusta where important roads are intersected.

On the main section of highway there are 670 linear feet of bridges—a 190-foot structure carrying the access road over the Southern Railway tracks near the north end of the project; two 240-foot bridges over Hollon Creek; and a 240-foot span over Horse Creek. Drainage structures include seven reinforced-concrete box culverts ranging in size from 4 x 4-foot to 10 x 12-foot. RC drainage pipe totals 30,000 linear feet, and was furnished by the Wallace Concrete Pipe Co. of Columbia, S. C. The pipe was laid by the Sloan Construction Co., Inc., of Greenville, S. C. Sloan also subbed all the blacktop-paving items. The general contractor did the culvert work.

### Typical Section

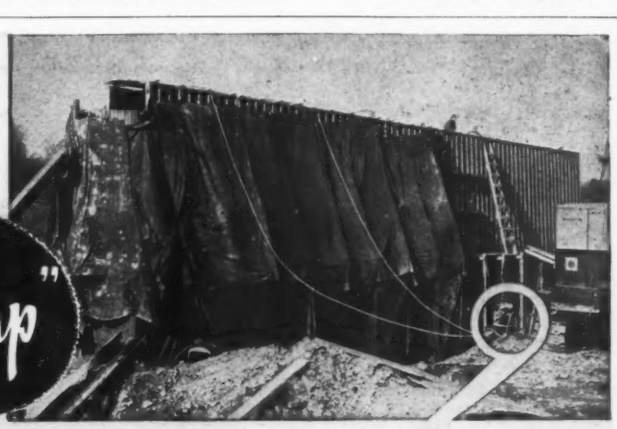
The dual pavements are 24-foot asphaltic-concrete surface courses separated by a 24-foot median and flanked on the outside by 15-foot 6-inch shoulders. At the center the median strip is depressed 1 foot 2 inches below the edge of the pavement. The pavement has a 2-inch center crown, while the shoulders have a 12 to 1 slope. Front slopes are 4 to 1 to a V-type ditch 2 feet 6 inches below the pavement. In cuts the backslopes are 2 to 1.

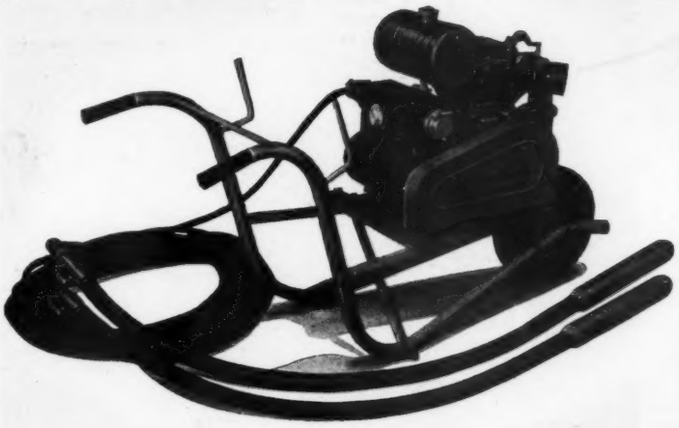
A sand-clay base course, 12 inches thick, supports the plant-mix pavement which is 2 inches thick and weighs 200 pounds to the square yard. The plant-mix was machine-laid on an in-

(*Continued on next page*)


announcing...

"Master Champ"
HYCYCLE VIBRATOR





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★ THOROUGHLY TESTED
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★ WATER TIGHT CONNECTIONS
★ EASILY ACCESSIBLE AND REPLACEABLE FUSES

ELIMINATES FLEXIBLE SHAFT
provides vibration *anywhere within 300 feet*

This new MASTER power unit is really the CHAMP of portable hycycle vibrators . . . it moves easily from place to place on the job as it weighs only 172 pounds. It operates TWO Master Model HV-8 Hycycle Vibrators or 1200 watts of light . . . or one vibrator and 600 watts of light. And best of all . . . IT PROVIDES VIBRATION ANYWHERE WITHIN 300 FEET of the power unit.

The MASTER CHAMP is powered by a 4/4 H.P. Wisconsin gasoline single cylinder air-cooled engine at 3200 R.P.M. The vibrating unit provides high speed vibration at 10,300 R.P.M. Conductor cables and operating vibrator cables are available in various lengths.

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Concrete surfacing attachments for vibrators

## Dual Highway Rushed To Big H-Bomb Plant

*(Continued from preceding page)*

verted-penetration-type mat placed without seal on the base course. This select material for the base course is continued out, 6 inches thick, under the shoulders, slopes, and median strip.

Earthwork on the project totaled about 1,500,000 cubic yards and for the most part was the kind of material that dirt-moving contractors dream about. It was chiefly sand and sand-clay, red in color, with not a rock to be found on the entire 24-mile job. The clay was just sandy enough to impart grit to the dirt for good binding, and to provide traction for the movement of equipment in wet weather. The material was easily worked, and was a factor in the good dirt-moving schedule that was maintained by the contractor.

### Grading the Highway

Contractor Potashnick had just finished a big earth-moving job on a high-level crossing for the New Orleans, Texas & Mexico Railway across Morganza Spillway, near Krotz Springs, La. So when he got the access-road contract he dispatched his big fleet of equipment, worth around $1,000,000, to South Carolina rather than back home to Missouri. A Fleco root rake was prominent in land-clearing operations, and a LeTourneau Rooter scarified ahead of the earth-movers where the soil resisted the blades.

Caterpillar tractors, 20 in number, predominated with 13 D8's, 6 D7's, and a D4. They teamed up with other equipment, pulling the Rooter, scrapers, tamping rollers, or loader; acting as pushers in loading the scrapers; dozing material short distances in cuts; or spreading the fills. The 6 LeTourneau Carryalls, averaging 15 yards on short hauls, were pulled by D8's. For the longer hauls, equipment included 7 Caterpillar DW10 rubber-tired tractors hooked up with Caterpillar No. 10 scrapers holding 8 yards struck and from 12 to 15 yards heaped.

Also on the long hauls a fleet of 14 bottom-dump Euclids were used holding 16 yards each. In the borrow pits a Euclid elevating loader, pulled by two D8's chained together in tandem, filled the wagons. In the roadway cuts draglines usually handled the loading. Draglines on the job included a Northwest 3½-yard, a Lorain 2½-yard, and two Lima ¾-yard machines.

*C. & E. M. Photo*

**In a roadside borrow pit at the top of a deep cut, a Euclid loader fills a Euclid.**

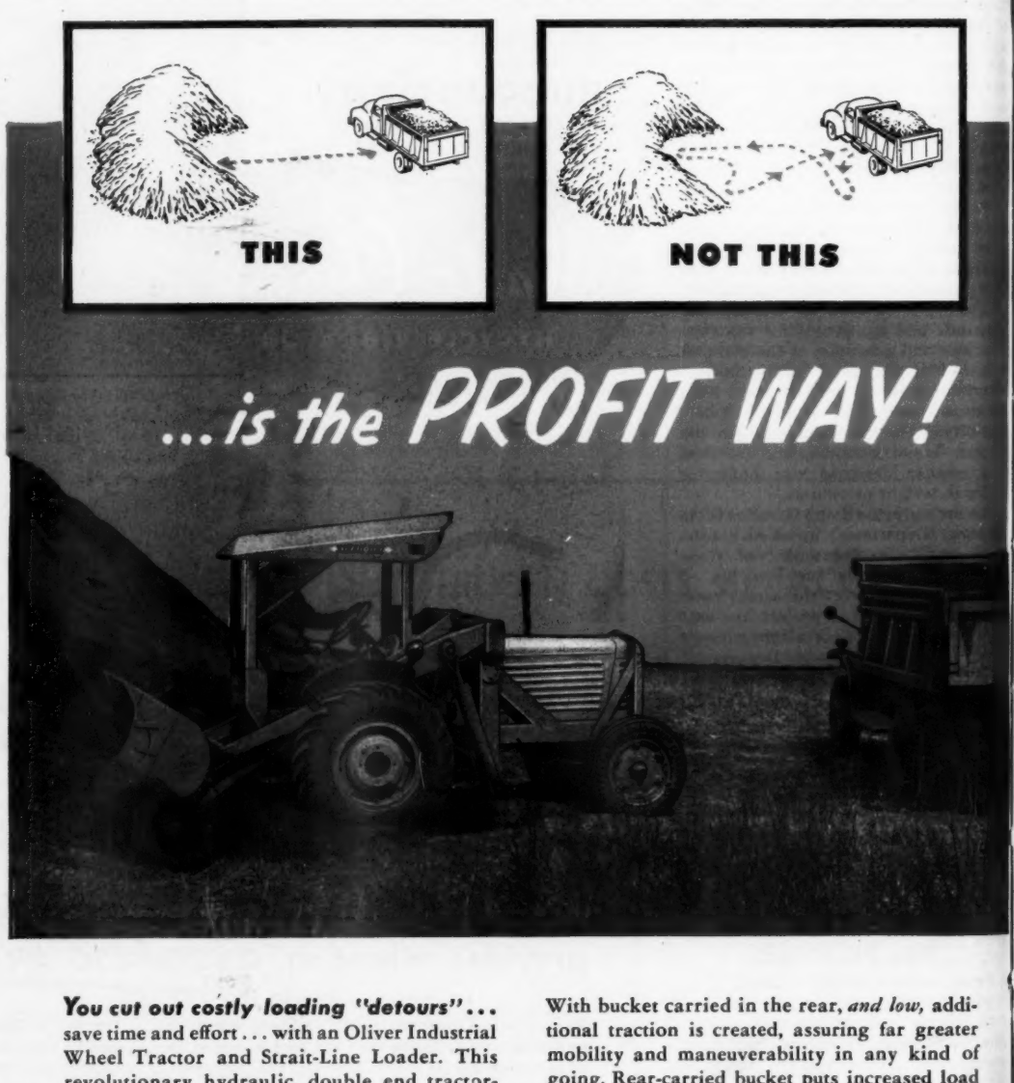
### Good Compaction

Fills were placed in 6-inch lifts, and compacted to a minimum of 90 per cent theoretical Proctor at optimum moisture content. Material coming from the cuts contained a good bit of natural moisture, and as there was no delay in spreading, water from tank trucks seldom had to be added. Compaction was achieved with the heavy equipment: one LaPlant-Choate and 2 LeTourneau tamping rollers; and 2 Tampo and 2 Bros pneumatic-tire rollers. One Case rubber-tired tractor, 3 Internationals, and 2 Fords were available for pulling the rollers.

Earth-moving proceeded at the rate of 25,000 to 30,000 cubic yards per day when operations were in high gear, with men and machines working, for a time, an 11-hour day. Five Kohler and 2 Caterpillar light plants supplied current to floodlights used when darkness overtook the work. Four Caterpillar No. 12 motor graders looked after the final shaping of the grade, and kept the haul roads in condition.

Material for the 12-inch sand-clay base, 25 feet wide for each lane, came from five borrow pits spotted fairly close to the right-of-way. The bulk of the base material was hauled by Euclids, spread by dozers and graders in 6-inch lifts, and compacted by traffic and pneumatic-tire rollers to a minimum of 95 per cent Proctor. Actually the average compaction hit 99 per cent.

*(Continued on next page)*


***You cut out costly loading "detours"...*** save time and effort... with an Oliver Industrial Wheel Tractor and Strait-Line Loader. This revolutionary hydraulic, double end tractor-loader can load either in front or rear... dump in front. The operator can load and dump without twisting or turning the tractor... travel a *straight line* between pile and truck.

Rear-end digging gives you far more loads with far less effort. "Push-Tilt" bucket with penetrating lips gives you a bigger load every time. With bucket carried in the rear, *and low,* additional traction is created, assuring far greater mobility and maneuverability in any kind of going. Rear-carried bucket puts increased load on rear wheels for increased traction... lightens load on front wheels for far easier steering.

Investigate the Oliver—Strait-Line for your operations. Your Oliver Industrial Distributor will give you the complete details. Or, write The Oliver Corporation, Industrial Division, 19300 Euclid Avenue, Cleveland 17, Ohio.

**THE OLIVER CORPORATION**

*A complete line of industrial wheel and crawler tractors*

**RUEMELIN**

**BLAST GENERATORS**

**FOR CLEANING BRIDGES — WATER TOWERS — STRUCTURAL STEEL**

Many contractors use Ruemelin Blast Generators for cleaning steel work to remove rust, paint and scale before repainting. These machines are also used to remove laitence from cement wherever concrete construction is in progress. A wet adapting nozzle can be furnished to convert dry machines to wet type of operation. Built in several sizes.

Write for Bulletin 38-B

**RUEMELIN MFG. CO.**

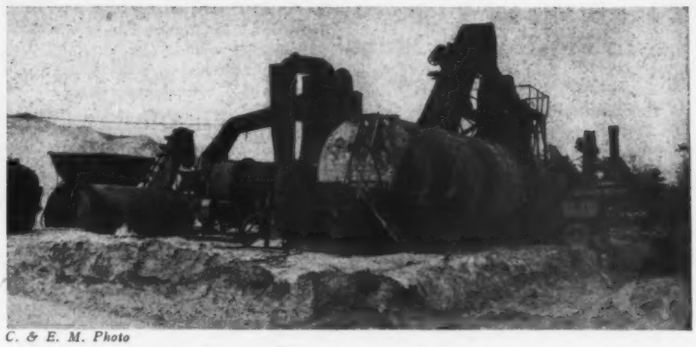
3848 N. Palmer St., Milwaukee 12, Wis.

*Manufacturers and Engineers*

SAND BLAST AND DUST COLLECTING EQUIPMENT, WELDING FUME COLLECTORS

C. & E. M. Photo

**Bros and Tampo pneumatic-tire rollers pulled by a Farmall M tractor compact the sand-clay base course of the access road.**



C. & E. M. Photo

**This is the Barber-Greene continuous-mix plant which turned out the hot-mix for access road. Trucks were loaded at the right.**

Disks and harrows were used in places to insure a good blending of the sand and clay soils.

### Blacktop Pavement

In preparation for paving, the compacted sand-clay base course was swept with a power broom to remove all loose material, then primed with MC-O asphalt, 0.30 gallon to the square yard, applied by an Etnyre distributor. The prime penetrated from ½ to 1 inch. This was followed by a shot of 150 to 200-penetration asphalt, applied at the rate of 0.40 gallon to the square yard at 350 degrees F. The bitumen was covered with stone, graded from ¾-inch down, put on with spreader boxes at the rate of 47 to 50 pounds per square yard, and rolled by 5-ton rollers and pneumatic-tire rollers to form a closely knit mat.

Priming started April 12, and paving got under way a week later, proceeding from the south to the north end of the project, while grading and base work was still in progress at the upper half of the access road. Sloan Construction Co., Inc., set up a Barber-Greene continuous-mix plant along State Route 781, less than a mile from where it intersects the new dual highway. The plant is rated at a 120-ton per hour capacity, and the subcontractor expected to lay from 1,000 to 1,500 tons of plant-mix in a 12-hour working day.

Local sand was used in the mix but stone for the aggregate was supplied by Weston & Brooker Co. of Columbia, S. C., and by a quarry at Blair, S. C. The material was delivered by rail to a siding of the Southern Railway at Clearwater, S. C., and from there trucked to the plant, a distance under 5 miles, and stockpiled. Asphalt for the mix was hauled in 4,000 and 5,000-gallon trailer tanks from the Standard Oil Co. in Charleston, S. C., a distance of 130 miles. Lime dust, a mineral filler for the mix, was delivered to the plant after a rail and truck haul.

### Continuous-Mix Plant

From the trailer tanks a 3-inch asphalt pump unloaded the bitumen into a 20,000-gallon storage tank, which was heated by a 125-hp locomotive-type oil-burning boiler. Fuel was contained in a 2,000-gallon tank on one side of the boiler, while on the other side was a 2,000-gallon water storage tank. Water was pumped from a nearby lake through a pipeline directly to the plant. Another 6,000-gallon storage tank held fuel oil for the dryer.

A Lorain crane with a 37-foot boom and a ¾-yard clamshell bucket loaded a 20-ton receiving hopper with aggregate which was fed to the bottom of a 20-foot cold elevator. At the top of the elevator the material passed through a 20-foot-long x 7-foot-diameter dryer where it was heated by a single Hauck burner. An exhaust fan drew off the fumes and the fines into a dust collector from which the fines were returned to the bottom of a 30-foot hot elevator. On top of this second elevator was a 3 x 6-foot gradation unit with a ¾-inch top-size screen.

Sand, stone, lime-dust filler, and asphalt (85 to 100 penetration) were mixed in the continuous mixer, with the asphalt in 7 per cent proportions. The blacktop was loaded from the front

(*Concluded on next page*)

FOR MORE ON LORAINS TURN THE PAGE

Here's the POWER you want on your job... plus DEPENDABILITY

Whether you're hauling dirt, spreading asphalt, or doing one of many other rugged jobs, you want a truck that fits the job—and provides plenty of low-cost power. Such a truck is a Dodge "*Job-Rated*" truck.

**New Dodge "Job-Rated" trucks provide more power than before.** On 2½-ton models, for instance, Dodge now offers a new 114 hp engine . . . the most powerful Dodge engine ever available in that field. And on high-tonnage models twin carburetion and exhaust system gives you plenty of extra power with extra economy.

And talk about maneuverability! Shorter turning diameters and new worm-and-roller steering gears on many models make the new Dodge "*Job-Rated*" trucks far easier to handle.

If it's dependability you're after, (and who isn't?) you'll go for features like the new Dodge moistureproof ignition and the new high-torque capacity starting motor. They help make starting easier in bad weather.

There's a Dodge "*Job-Rated*" truck to fit your need *exactly*. Get the proof from your nearby Dodge dealer today.

DODGE "Job-Rated" TRUCKS

**How Dodge Trucks are "Job-Rated" for the Construction Business**

A Dodge "*Job-Rated*" truck is engineered *at the factory* to fit a specific job . . . save you money . . . last longer.

Every unit from engine to rear axle is "*Job-Rated*"—factory-engineered to haul a specific load over the roads you travel and at the speeds you require.

***Every unit that SUPPORTS the load***—frame, axles, springs, wheels, tires, and others—is engineered right to provide the strength and capacity needed.

***Every unit that MOVES the load***—engine, clutch, transmission, propeller shaft, rear axle, and others—is engineered right to meet a particular operating condition.

"Job-Rated" TRUCKS DO THE MOST FOR YOU

## Dual Highway Rushed To Big H-Bomb Plant

*(Continued from preceding page)*

of the plant into a fleet of 15 trucks holding 7 tons each. Average haul from the plant was 7 miles. On the road two Barber-Greene Finishers, working in adjoining 12-foot lanes, laid the mix in a single course weighing 200 pounds to the square yard. Two Galion 10-ton tandem rollers compacted the pavement to a thickness slightly under 2 inches.

The plant was operated by a group of electric motors, with the power supplied by three Caterpillar diesel-electric generator sets. Biggest of the three, a D13000 diesel with a 39.8-kw generator, drove four motors—a 5-hp on the asphalt pump; a 10-hp on the hot elevator; a 50-hp on the dryer; and a 60-hp on the mixer. The other two units, both D4600 diesels with 18.5-kw generators, worked in series to furnish power for the remaining motors and light for the plant. The other key motors were a 40-hp on the exhaust fan; a 10-hp on the cold elevator; a 5-hp on the gradation unit; and a 2-hp on the elevator for the mineral filler.

### Quantities and Personnel

The major items on the 24-mile divided-highway project included the following:

| | |
|---|---|
| Excavation | 1,500,000 cu. yds. |
| Select material, shoulders and slopes | 100,000 cu. yds. |
| Sand-clay base course | 325,000 cu. yds. |
| Concrete gutter | 50,000 lin. ft. |
| Asphaltic concrete | 61,000 tons |

On the prime contract a force of approximately 300 was employed at the peak of operations by R. B. Potashnick under the direction of Irvin Garms, Superintendent on earthwork, and George Shelton, Superintendent on bridges and structures. James E. Young was Office Manager.

Sloan Construction Co., Inc., on the bituminous work averaged 30 employees, with L. G. Gillim, General Superintendent, and Lloyd Lewis, Plant Superintendent.

For the South Carolina State Highway Department, J. C. Asbill was Resident Engineer. The project was located in District 1 of which D. M. Crockett is District Engineer, with headquarters at Columbia. The Department is headed by C. R. McMillan, Chief Highway Commissioner, with S. N. Pearman, State Highway Engineer. J. D. McMahan, Jr., is Construction Engineer, and W. J. Gooding, Jr. is Bridge Engineer.

## New Circulating Bar

A full-circulating spraybar 24 feet long, which one man can lift, is a new development of Littleford Bros., Inc., 453 E. Pearl St., Cincinnati 2, Ohio. The Lite-Wate circulating spraybar can be folded for traveling to and from the job. Its light weight—less than half that of steel—greatly reduces the load at the rear of the Littleford Spray Master.

The Lite-Wate sprays by pressure and circulates materials by vacuum. This, the manufacturer says, assures clean, even starts, instant shut-off without drip, and suck-back of any material left in the bar after spraying. Lengths of bar may be added by loosening two bolts. When spraying, all nozzles are said to open instantly and simultaneously; each nozzle can be individually turned off to give any desired width of spray.

The load at the rear of the Littleford Spray Master is greatly reduced by the new Lite-Wate full-circulating spraybar.

Further information on the Lite-Wate spraybar may be secured from the company by requesting Bulletin No. 14. Or use the Request Card at page 16. Circle No. 353.

## Fox Now With A. O. Smith

John Fox represents the Welding Products Division of A. O. Smith Corp., Milwaukee, in the Greater St. Louis area. He was formerly District Manager for Machinery & Welder Corp.


HINGED PLATEGRIP
BELT FASTENER No. 500
FOR HEAVY CONVEYOR BELTS OF CHANGING LENGTH

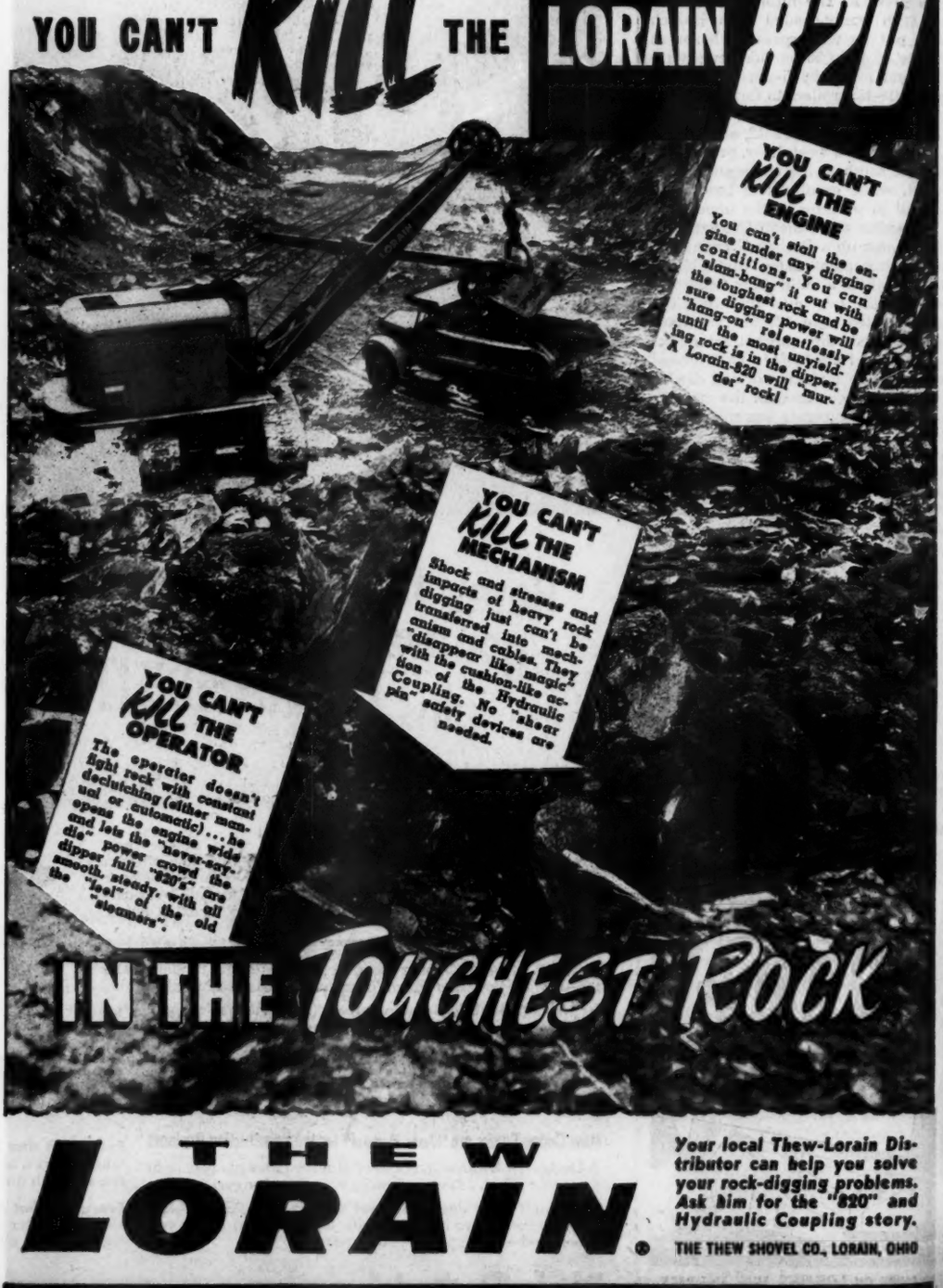
These heavy-duty belt fasteners make a strong, flexible joint in conveyor belts, belts of any width and of from 3/16" to 1/2" thickness. They offer special advantages in mines, quarries or industrial setups where length or position of belt is frequently changed, because sections can be removed or added at will. Joints are opened for this purpose by simply pulling out the hinge pin.

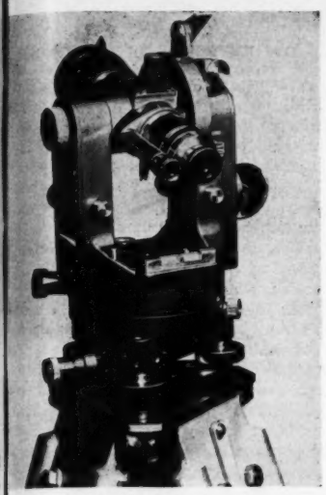
Easily and quickly applied on the job or in the shop. Special design gives deep compression into belting and smooth, flush joint.

*Write for Circular.*

ARMSTRONG-BRAY & CO.
5382 Northwest Highway, CHICAGO 30, U. S. A.




YOU CAN'T KILL THE LORAIN 820
YOU CAN'T KILL THE ENGINE
You can't stall the engine under any digging conditions. You can "slam-bang" it out with the toughest rock and be sure digging power will "hang-on" relentlessly until the most unyielding rock is in the dipper. A Lorain-820 will "murder" rock!
YOU CAN'T KILL THE MECHANISM
Shock and stresses and impacts of heavy rock digging just can't be transferred into mechanism and cables. They disappear like magic with the cushion-like action of the Hydraulic Coupling. No "shear pin" safety devices are needed.
YOU CAN'T KILL THE OPERATOR
The operator doesn't fight rock with constant declutching (either manual or automatic) ... he opens the engine wide and lets the "never-say-die" power crowd the dipper full. "820's" are smooth, steady with all the "feel" of the old "steamers".
IN THE TOUGHEST ROCK
THEW LORAIN ®
Your local Thew-Lorain Distributor can help you solve your rock-digging problems. Ask him for the "820" and Hydraulic Coupling story.
THE THEW SHOVEL CO., LORAIN, OHIO



An optical plummet and reading system, and the repeating lever which simplifies repetition of angles, feature the FS Model 4150 R transit.

## New Optical Transit

An optical transit with several innovations has been introduced by Trans-Global Co., 1480 Broadway, New York, N. Y., American distributor for Filotecnica Salmoiraghi, Italian manufacturer of precision instruments. The optical plummet and reading system, the repeating lever which simplifies the repetition of angles, and the compact design of the new FS Model 4150 R are of interest. All operations are performed from a single position behind the instrument.

The optical plummet, which eliminates plumb-bob swing and wind displacement, permits quick setup, and centering of the ground point. The ground point is viewed through the plummet, the center of which is the vertical projection of the instrument axis on the ground. A large shifting radius permits quick centering of the ground point in the plummet reticle circle.

The optical reading of the glass graduated circles eliminates verniers and errors of parallax. Readings of both the horizontal and vertical circles are taken by looking into the microscopic eyepiece next to the telescope. The optical micrometer scale permits instant readings to 6 seconds.

The repeating lever on the transit automatically takes care of upper and lower motion control. With the lever up, the horizontal circle is clamped to the instrument base and the microscope readings change as the angle is turned. With the lever down (returning for the repeat) the circle is clamped to the alidade and the readings are fixed. The transit may be plunged and reversals taken the same way.

The horizontal and vertical circles, leveling screws, and optical systems are completely enclosed for protection against dirt, dust, and moisture. The telescope has single and double reticle crosshairs—sighting with the double is often simpler and more accurate. Horizontal and vertical stadia hairs are in the ratio of 1 to 100.

An adjustable rigid-leg tripod and a sturdy metal carrying case are sold with the instrument. The list of accessories includes a striding compass, a compact electric light which fits on the mounting plate, a telescope level, an optical distance-measuring device, a traverse sight, and eyepiece prisms.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 304.

## Ferguson Managers

Allen S. Gordon, formerly of the United Nations Food and Agricultural Organization, is Assistant to the General Sales Manager of Harry Ferguson, Inc., Detroit, Mich. Blair Williams has replaced Claude B. Quillian as Eastern Regional Manager for the company. He will coordinate Ferguson dealer and distributor sales activities in Michigan, New York, Maine, Massachusetts, Vermont, New Hampshire, Connecticut, Rhode Island, and New Jersey. Mr. Quillian now operates the Ferguson distributorship in Michigan.

## Setup for Central Mixing

A 4-page booklet emphasizes the economies of mixing concrete in a central plant and delivering it in non-agitating haulers. The booklet was prepared by the Dumpcrete Division of Maxon Construction Co., Inc., 131 N. Ludlow St., Dayton 2, Ohio. It pictures central mixing plants in operation on 12 different jobs and gives data on the Dumpcrete haulers, available in 2, 3, or 4-yard sizes.

This literature may be obtained from the company by requesting Pamphlet No. 111, or by using the Request Card at page 16. Circle No. 267.

## Hydraulic-Control Manual

A handy pocket-sized guide on the operation and care of the "direct-acting" hydraulic control of P&H power cranes and shovels has been released by Harnischfeger Corp., 4400 W. National Ave., Milwaukee 14, Wis. It tells operators how to get maximum efficiency out of this system.

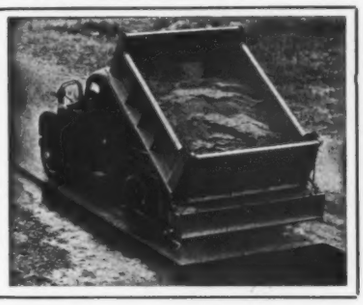
The 28-page booklet contains complete information on the hydraulic control system and describes the correct way to dismantle, adjust, and replace parts. Identification of parts is made easy by numerous keyed photographs and cutaway drawings. A 4-page fold-out diagram shows the entire hydraulic system.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 345.


Do your sealcoating and ice control jobs the fast easy Swenson way. Spreads any width or amount desired.

*Free Information*

**Swenson Spreader & Mfg. Co.**
Lindenwood, Illinois



WISCONSIN
Report No. 7279

FORD TRUCK ECONOMY RUN

ADOLPH ULMER, Jr.
Beaver Dam, Wisconsin

# "I truck 8 tons of sand for less than 4½¢ a mile!"

**Ulmer says, "On tough jobs my F-7 Ford Truck with POWER PILOT is economical, and I also get all the *power* I need."**

Ulmer was one of 5,000 owners who entered the nationwide Ford Truck Economy Run. He kept daily running cost records on his 1950 Ford F-7 Dump and reports: "My truck traveled 18,955 miles in rough going with an average load of 16,000 lbs. My running cost expense amounted to $825.30 for gas, oil, maintenance and repairs—that's a running cost of only 4.35 cents a mile!"

Like others who rely on Ford for low running costs, Ulmer is sold on the periodic, money-saving service he got from his local Ford Dealer. For more facts on the trucks that last longer *and* save you money every mile—mail the coupon below.

**This new 145-h.p. Ford F-8 Big Job** with special dump trailer has power reserves that construction men really appreciate! Tractor-trailer gross combination weight rating is 39,000 lbs.

## FORD TRUCKING COSTS LESS

**because FORD TRUCKS LAST LONGER!**

*Using latest registration data on 7,318,000 trucks, life insurance experts prove Ford Trucks last longer!*

## POWER PILOT helps CONSTRUCTION MEN hold down hauling costs

**The Ford Truck POWER PILOT is a simpler, fully-proven way of getting the most power from the least gas.**

• It automatically meters and fires the right amount of gas, at precisely the right instant, to match constantly changing speed, load and power requirements.

Unlike conventional systems, the Power Pilot uses one control instead of two, yet is designed to synchronize firing twice as accurately.

You can use regular gas . . . you get no-knock performance. Only Ford in the low-price field gives you Power Pilot Economy!

MAIL THIS COUPON TODAY!

**FORD Division of FORD MOTOR COMPANY**
**3251 Schaefer Rd., Dearborn, Mich.**

Send me without charge or obligation, detail specifications on Ford Trucks for 1951.

Full Line ☐ Heavy Duty Models ☐
Light Models ☐ Extra Heavy Duty Models ☐

Name_____
(Please print plainly)
Address_____
City_____ Zone____ State_____

## Improved Lubricator For On-the-Job Work

Field lubricators, redesigned for simple, rapid equipment care on the job site, have been announced by Gray Co., Inc., 60 11th Ave. N. E., Minneapolis 13, Minn. The Graco Convoy Lubers are of two general classifications: ready-to-work assembled units, and job-planned units. The latter are selected and assembled by the contractor to meet particular greasing needs.

The Convoy Lubers can be obtained completely equipped with supply pumps; drum covers; lubricant hoppers; hose reels for dispensing high-pressure lube, gear lube, track lube, motor oil, diesel-engine oil, and air; storage drawers; a tool box; air compressor; steel frames on hardwood skids; and all necessary hose, control valves, nozzles, adapters, and pressure regulators.

All grades of grease and oil required for lubrication are pumped directly from original containers, or from lubricant hoppers if desired, and dispensed through reel-mounted 30-foot hose. Two types of air-operated Powerflo pumps are available, the Mogul and the Standard. The Mogul double-action pumps are designed for high-volume delivery and have an air-pressure range of 20 to 175 psi. The Standard pumps, designed for average greasing requirements, have an air-pressure range of 100 to 175 psi.

Further information may be secured from the company by requesting Catalog No. 700. Or use the Request Card at page 16. Circle No. 330.

## Power Screw Drivers

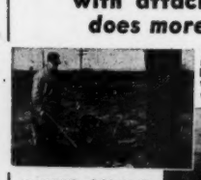
Pistol-grip screw drivers have been added to the Silver Line series of portable electric tools made by Independent Pneumatic Tool Co., 175 State St., Aurora, Ill. The ED Series comes in **13 attachment and speed variations for** driving screws up to size No. 12 and setting nuts with a thread up to ¼ inch. The screw drivers have speeds of 500, 800, and 1,100 rpm in all-straight and 25-degree-angle attachment models, and 660 and 880 rpm in right-angle models, with positive, kick-out, and double-slip clutches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 322.

## Hyster Transfers

The Hyster Co., Portland, Oreg., has announced two personnel changes. J. W. Morgan, Assistant Sales Manager, Eastern Tractor Equipment Division, Peoria, Ill., has been transferred to the Industrial Truck Sales Division as Manager of the North Central District with headquarters in Buffalo, N. Y. Donald R. Shaffer, former North Central District Manager, succeeds John E. Mitchell as Northeast District Manager.


*The*
**BACHTOLD MOWER**
**with attachments does more jobs**



It SAWS. Big 20" saw blade can be used in either horizontal or vertical position. Powerful, fast.

It MOWS right up to bushes, trees, buildings, etc., cutting a 20" swath evenly. Adjustable runner. It CULTIVATES almost any kind of soil.

●Easy starting ●Finger-tip control ●Portable ●Compact ●Fully guaranteed ●Push-type and self-propelled-type models

**BACHTOLD BROTHERS, INC.** Forrest, Illinois

**The Graco Convoy Lubers have been redesigned for fast, easy on-the-job lubrication. They come in ready-to-work assembled units and in job-planned units selected by contractors to meet particular greasing needs.**

## Brochure on Servicing Communications Equipment

A 4-page illustrated booklet, which details services and parts-protection plans for mobile communications systems, has been prepared by the Technical Products Division, RCA Service Co., Gloucester, N. J. It covers service programs for mobile and microwave communications equipment such as turnkey installation, installation supervision, and scheduled and emergency service.

The literature explains that in order to obtain maximum performance from your communication system, it must be properly installed and periodically serviced. It points out that the RCA communications service is flexible—certain basic features are available in a variety of combinations. RCA has a request-service arrangement for communication users who do not have regular service.

This literature may be obtained from the company or by using the Request Card at page 16. Circle No. 288.

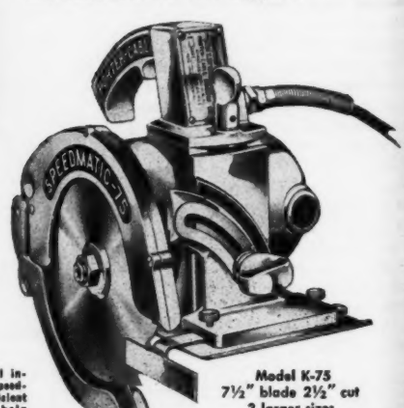

# Balance

**makes all-day sawing easier...**

PORTER CABLE **Speedmatic** SAWS

**"I grab for the Speedmatic when all-day sawing is ahead of me"...**

... that's the way the man on the job shows his preference for the saw that is *built for easier handling.* Speedmatic is center-poised, to cut straight and true. No "power jump" when starting to cut. It practically feeds itself—no cramping, no veering. Follows the line with only the slightest guiding. Ends the cut with the saw resting on the main piece. On bevels, Speedmatic holds as steady as on straight cuts. And when the work is in an awkward or hazardous location, the Speedmatic operator always has one hand free for safe support.



Model K-75
7½" blade 2½" cut
3 larger sizes

**All these Speedmatic Features Add Up to True BALANCE!**

When you use a Speedmatic, you discover why "It's Balanced When You Lift It; It's Balanced While You Run It." You'll like the center-mounted handle; the extra broad base; the blade on the right; the straight-line, helical gear drive; the compact motor and counter-balanced moving parts . . . features that make the big difference between ordinary power sawing and Speedmatic sawing. Ask for a Speedmatic demonstration at your dealer's, or on the job. It's an eye opener.

**FREE**

Write us for full information about Speedmatic Saws and efficient accessories that help speed construction work.

**PORTER-CABLE MACHINE CO.** 7047 N. SALINA ST., SYRACUSE, N. Y.
In Canada: Write Strongridge, Ltd., St. Catharines, Ont.

MANUFACTURERS OF SPEEDMATIC AND GUILD ELECTRIC TOOLS—THE BALANCED LINE

# U. S. Firm Adopts Swedish Tunneling

## New Method Reverses Trend Toward Bigger Holes, Uses Less Powder, and Hurries Colorado-Big Thompson Job

By RAYMOND P. DAY,
Western Editor

• AN improved basic tunneling method, used in Sweden and South Africa for several years, has been adopted by an American firm and combined with certain U. S. machinery and methods to revolutionize hard-rock tunneling in the Rocky Mountains.

Gibbons & Reed, heavy construction specialist from Salt Lake City, Utah, is the contractor. The job is Rattlesnake Tunnel, a $1,294,000 undertaking near Loveland, which will be part of the Colorado-Big Thompson distribution system on the east slope of the Rockies. The supervising agency is the U. S. Bureau of Reclamation. The Swedish tunneling method is that which was originated by Aktiebolaget Atlas Diesel of Stockholm.

Using this method, Gibbons & Reed has maintained a daily sustained average of 53 feet in an 11-foot horseshoe section through mica schist and pegmatite, for the first 5,400 feet of what ultimately will be 8,764 feet of Rattlesnake Tunnel.

### Swedish-Method Features

According to its originators, the Swedish tunneling method is largely based on the following points: (a) light rock drills on pneumatic pushers, (b) drill steels using hard metal bits, (c) a simple movable platform of light weight from which drilling takes place, and which permits the convenient passage of loaders and cars. The platform also serves as a traveling crane for mounting cars or tubs.

Certain other advantages accrue from the method, and Gibbons & Reed seized upon several points from the orginators' claims. For example, very short times are required for pushing the jumbo forward into the heading and pulling it back after drilling is completed. High rock-drill performance seemed possible to the contractor because the light drilling equipment would handle more easily. There was a possibility of using long drill steel, with fewer renewals than had been the case with carbon instead of alloy steel.

The drill steel stays sharp, thanks to a tungsten-carbide insert, and drilling speed is high. Only one man operates each rock drill. Therefore, the showing per working hour promised to be good even while planning was still in the theoretical stage. Because of the possibility of using the drills in close quarters parallel to the walls, and moving them from one point to another, a relatively large number of holes seemed possible. Naturally, this would tend to make for a smoother wall, decreasing the cost of lining the tunnel later on.

Because of their lighter weight, the drills promised to cost less initially and spare parts were likely to be cheaper. Air consumption promised to be remarkably low, with resultant decrease in compressor capacity. Smaller-sized air pipes were indicated, and this would of course be important from an investment standpoint in a long tunnel.

### Best Points Merged With Ours

Taking the best points of the Swedish method, Gibbons & Reed combined them with American methods. Light alloy steel, with a chisel-bit tungsten-carbide insert 1¼ inches across, was imported from Sweden. The Sandvik Coromant steel ranged in lengths from 2 to over 10 feet. The ⅞-inch hexagonal steel required a 4¼-inch drill chuck, and that was immediately a problem because the standard American chuck for ⅞-inch is 3¼ inches.

Moreover, the lighter steel required pneumatic operation which would rotate it faster than normal, and deliver increased drill-point impact *numbers*, while the impact foot-pounds were less than normal.

Several Atlas rock drills, manufac-

(*Continued on next page*)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Operates from power take-off
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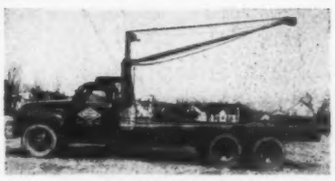

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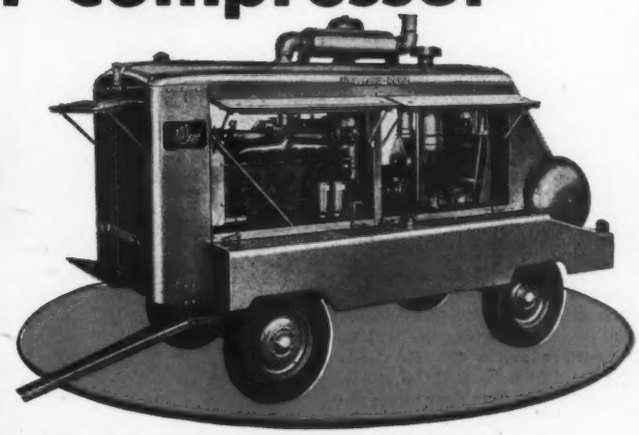

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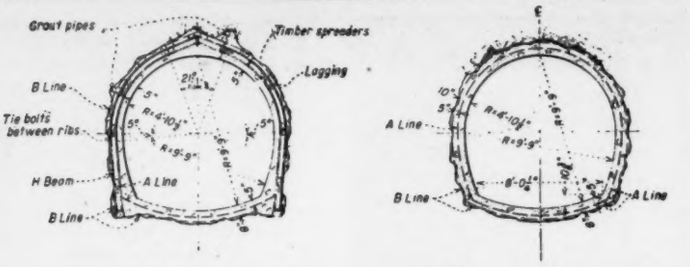


SUPPORTED TUNNEL SECTION UNSUPPORTED TUNNEL SECTION

**Here are design drawings of Rattlesnake Tunnel showing supported and unsupported cross sections. Its finished dimensions will be 9.75 feet.**

*U. S. Bureau of Reclamation Diagrams*

*C. & B. M. Photo*

**A Greensburg locomotive and its string of Card cars dump muck from Rattlesnake Tunnel. Gibbons & Reed air-compressor and repair shops are in the background.**

## U. S. Firm Adopts Swedish Tunneling

*(Continued from preceding page)*

tured in Sweden, were imported on trial. Several American-made machines were also tried, but early experiments indicated that the machines had too much power for the small-size steel.

General Superintendent Frank Peters then mentioned his problem to the Denver field man of Gardner-Denver. The company had just the machine, complete even to the unstandard 4¼-inch chuck, but it was a *light* rig, so light men had never tried it in a tunnel before. It was Gardner-Denver's Model SF-73, a 2¾-inch-bore automatic drifter. Gibbons & Reed ordered one, on trial.

So well pleased was Peters over the way this machine performed that the larger drills, some of them unused, were traded in on the smaller machines. The drill problem was standardized.

What Gibbons & Reed was after, too, was better powder performance. Theoretically, at least, a near-perfect tubular hole of small diameter should use less powder and utilize more of its energy. This proved true in practice.

The Swedish method of drill mounting was discarded in favor of American schemes. Gardner - Denver hydraulic boom mountings are being used successfully on the top of the drill jumbo, while the lifter machines use a standard bar mount.

The theory of less air was proved by compressor requirements. In the air-supply shed are two 600-cfm Gardner-Denver machines, driven by 125-hp electric motors, and a 450-cfm Gardner-Denver driven by a 75-hp motor. There is a thin concrete floor under the machines, but they do not require the usual heavy foundation common to larger compressors.

So far as air and water lines are concerned, no fair comparison can be made. The air line to drills is 6-inch, the water line is 4-inch, and the fan or blower line is 18-inch Armco Hel-Cor pipe. Fan equipment consists of a 7,800-cfm Sutorbilt, driven by a 100-hp G-E motor, and a smaller 6,000-cfm Joy booster fan, driven by a 15-hp motor.

Breakage of the tough alloyed Swedish steel has been so little that the men have to hunt like mad to find enough scrap to hang the various lines on the tunnel walls as drilling proceeds.

### Drilled From East Portal

The tunnel is being drilled from one heading, starting at the east portal. As the tunnel is extended under a high mountain ridge near Bald Mountain, surveyors keep it straight and hold its invert grade constant at 0000.00127. Center-line points are set every 400 feet, and a new roof hub is established on every swing shift so headings can be checked accurately for tights.

### Follow a Typical Round

A typical round consists of a perimeter head with a 5-hole center burn, with 39 holes breaking into the center 5-hole burn. At first a pyramid cut was tried, but the present method works much better.

Five of the Gardner-Denver 73's are available. Four are in use on the drilling jumbo, while one is on hand as a standby. The jumbo is a light car-mounted affair, with the two top machines boom-mounted and the two lower ones mounted on standard bars.

*(Continued on next page)*

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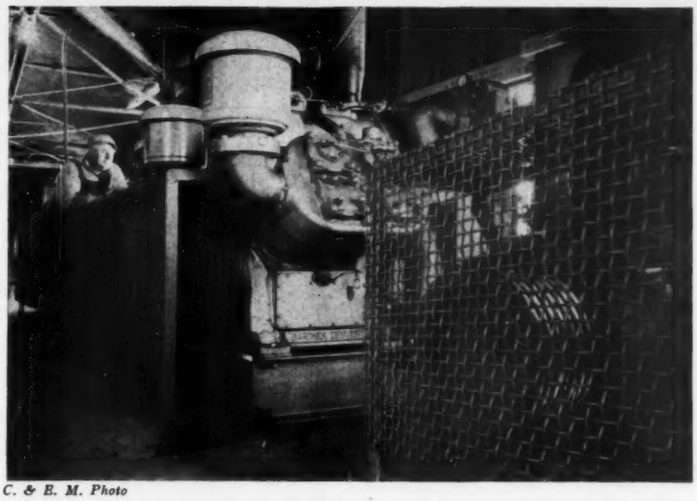
Each drill sinks about one-fourth—or 11—of the total holes. It is customary for the machines to finish drilling in about 55 minutes, using 10-foot steel.

So far as Peters can see, the steel is giving excellent service life. In fact, some of the steel has been cut off back of the bit, after the bit has worn down, and threaded for bit use.

Because of the small-diameter drill holes, powder cartridges have been reduced from the 1⅛-inch sticks to 1-inch size. Du Pont 45 Gelex, with Atlas delay caps from No. 1 to 10, is used. The delays are arranged so that after the 5-hole burn lets go, the cross section breaks progressively to the tunnel perimeter. The efficient use of less powder has reduced the amount of steel shoring by at least 25 per cent, according to Peters. Only in the very worst formations was shoring necessary . . . the remainder breaks out clean.

A 220-volt electric line is used to fire the charges, and after a few minutes the fans have the smoke sucked out, and the round is ready to be removed.



*C. & E. M. Photo*

**Gardner-Denver compressors in the main air-supply shed are light and do not require heavy foundations. Compressor Engineer "Big Ed" Thomsen leans against the machine, apparently with little to do.**

It might be said, in passing, that the 5-hole burn does not throw rock excessively, especially when the holes are held close together. Blasting characteristics of powder loaded into the smaller-diameter holes is also excellent. Fragmentation is the equal in every respect of many a job where larger holes and more powder are used.

All mucking is being done by an Eimco 40, which has been so dependable it lost less than 1½ rounds in over a mile of tunnel. The Eimco machine loads to 15 Card dump cars, each of which will cart away between 70 and 80 cubic feet of broken rock. A California switch is used in loading, and it is moved ahead each day. It consists of a parallel track with switches. Empties are held on the siding, and switched out ahead to the front of the train, one at a time, as needed. The 7½-ton Greensburg locomotive pushes it ahead to the mucker. There are two of the Greensburg locomotives on the job.

A full round often fills 23 to 24 cars, especially when the rock breaks out beautifully and leaves the bottom of the drill holes visible in the heading, as often happens. During the loading of the muck pile, the crew uses huge quantities of water to keep the rock wet, keep dust down, and reduce gas. It seems to improve crew efficiency when the tunnel is clean.

At the same time the Eimco mucker is performing, a day crew of laborers keeps the excess spillage shoveled up into the cars. Every reasonable effort is made to keep the fine-grading up with primary excavation. Later on, when the tunnel is lined, that muck is out of the way, instead of being caked and hardened and hard to get out.

The Card cars are taken out to a disposal area near the east portal, and an entire trainload is dumped in about 30 seconds. These cars have a guide wheel which rolls over a dumping arc, and they can dump as fast as the train can move. Since the disposal area is somewhat limited in size, the trains dump over a trestle, and a D8 Caterpillar and dozer, working below, stacks the material on a pile which will be much higher than the tracks.

Through supported ground and all, the sustained average footage is 53 per day. The best day's run was 75.5 feet. In January, Gibbons & Reed excavated 1,474 feet of Rattlesnake Tunnel, working 6 days a week on a 3-shift basis. In the short month of February, 1,381 feet were removed. In 27 days in March, 1,620 feet were removed. The safety record has been good, and it is an extraordinarily clean, well organized job.

### Lining Later

The job had 700 calendar days to run after it was started November 21, 1950, but by June of 1951 the miners expected to hole through at the west portal. Lining would then begin, and when this magazine visited Rattlesnake Tunnel, preparations already were under way to get the lining equipment in shape.

Briefly, Peters plans to place the lining from west to east. A curb will be placed first, then the arch, and finally the invert. Concrete will be dry-batched outside the east portal, hauled by train in special batch cars to a double-drum Ransome mixer inside the tunnel, and sent by wet conveyor from the mixer to a Pumpcrete hopper. Final concrete delivery will be by the Pumpcrete method. The traveling steel arch forms, of conventional design, were manufactured in Denver. Finished dimensions of the tunnel will be 9.75 feet.

### Peters: Progressive Pusher

General Superintendent Frank Peters is a young man. There is hardly a gray hair in his head . . . or for that matter, many hidebound ideas. But he's a tunnel stiff!

"That man he drive a tunnel like crazy", said the labor-gang foreman, as

*(Concluded on next page)*

COME rain and mud, come blistering heat or freezing cold, *Texaco Marfak stays on the job.* Seals mud and dust out of chassis bearings. Protects against rust. And not even the heavy loads and rough terrain of construction work can jar or squeeze *Texaco Marfak* out of the bearings. No wonder chassis parts last longer, maintenance costs less.

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To protect crawler track mechanisms, use *Texaco Track Roll Lubricant.* It seals out dirt and moisture, wards off wear and rust.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

## U. S. Firm Adopts Swedish Tunneling

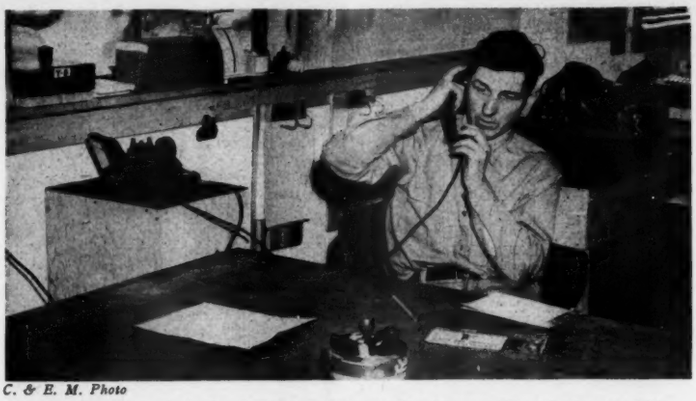
*(Continued from preceding page)*

he hurried to get the day's cleanup done back around the California switch.

Peters views the new tunneling method, which he is using, with an open mind and genuine interest. Too often in his young life he's seen a new improvement come along, battle the inertia of human prejudice, and finally survive to be hailed as the greatest thing that ever happened to the industry. Peters cited tungsten-carbide drill bits as an example. Privately he believes that they are one of the most significant advances ever made in the drilling business, and yet he still often sees foremen and superintendents who disagree with him.

"We've got to try the new ideas, or how can we make progress?" he said.

His willingness, and his company's, to try out a drilling method which actually seemed to reverse present trends, is paying off. Exactly how much is a company matter of business, but progress is excellent and the investment in machines is small for a job of that size. The miners speak highly of the smaller drills, smaller but better steel and bits, and their progressive boss. He claims their knowledge and workmanship have made possible the job progress.



*C. & E. M. Photo*

**General Superintendent Frank Peters is long on planning as well as field generalship. He's ordering urgent parts from Denver by phone.**

### Big Thompson Progress

Completion of Rattlesnake Tunnel will forge another link in one of the Bureau of Reclamation's most celebrated transmountain water diversions. Many of the components of the Colorado-Big Thompson Project have been finished and are coming in on the line.

The Colorado-Big Thompson picks up water from the Colorado River, on the west side of the Continental Divide near Granby, and brings it through a tunnel 13.06 miles long. Powerful pumping stations will lift the water into west-slope reservoirs, where it will then flow by gravity from its point of pickup at the Adams transmountain tunnel.

The water is destined to supplement east-slope irrigation and domestic supply, but before it will reach its agricultural destination it will drop through a series of power plants on the east slope to generate power for the general area. Power thus produced will be distributed over a transmission grid.

Rattlesnake Tunnel is well down in the east-slope system. It is far below Estes Park Power Plant, and a considerable distance below Olympus Dam, Pole Hill Tunnel, and other east-slope structures above that level.

Some of the water from Olympus Dam is now passing down the Big Thompson River, and is being picked up for delivery to the Poudre Supply system near Fort Collins. The Granby Pumping Plant has been tested, and slowly but surely the wheels of this mammoth and interesting project are beginning to turn. The latest development is the possibility of a $45,000,000 atomic center near Boulder, and if that comes to pass, every kilowatt of electrical energy generated by Colorado-Big Thompson will be urgently needed.

### Personnel

Work on the Gibbons & Reed contract was designed and is being directed under the supervision of L. R. McClellan, Chief Engineer of the USBR, with Avery Batson as Regional Director and Frank Mateka as Construction Engineer.

For Gibbons & Reed, Frank Peters is General Superintendent, Don Hill is Engineer, and shift bosses are Harold Wehr, James Winston, and Howard Hitson, Howard Harrison is Master Mechanic and R. C. Boggs is Office Manager. Olle Hedwall represents the Swedish manufacturing firm.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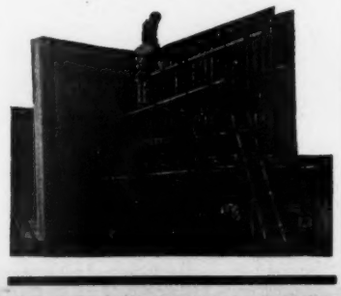



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Useful where larger equipment can't go—on open areas, too, it convincingly outperforms other equipment—achieving up to 97.2% of absolute compaction in only 2 passes, compared to 94.2% in 8 passes with a 25-ton rubber-tired roller; 95.6% in 6 passes with an ordinary 12-ton roller; 96.2% in 6 passes with a 7-ton vibratory roller.

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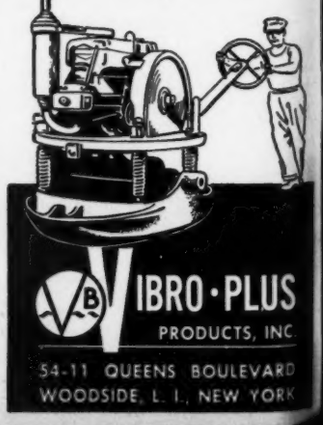

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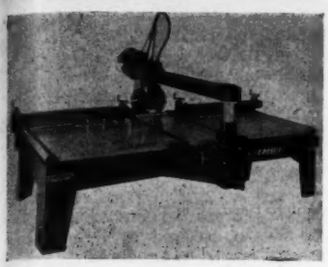

The Comet panel cutter (shown here in cutoff position with rip-feed pressure rolls swung clear of table) will handle panels up to 4 feet wide in automatic cutoff. It will rip panels of any length.

## Production Cutting With New Power Saw

A power saw for accurate production cutting of panels is the latest development by Consolidated Machinery & Supply Co., Ltd., 2031 Santa Fe Ave., Los Angeles, Calif. The Comet automatic panel cutter crosscuts panel material up to 2 inches thick and 48 inches wide and will rip material of any length.

The saw is powered by a 5-hp motor (three-phase 3,600-rpm 220/440-volt) which is totally enclosed and fan-cooled. The feed for crosscut is powered by a ¾-hp reversible motor and the rip-feed rolls are powered by a ½-hp gear-head motor. The crosscut feed rate is about 50 fpm and the rip feed about 40 fpm, the company says. The travel of the crosscut feed can be regulated by a trip setting on the overhead arm. Rip-feed pressure rolls swing to the back of the work table leaving it clear to receive material for crosscutting.

All controls and switches are at the front of the machine within easy reach of the operator. The work table is heavy hardwood and has rollers at each end. The machine is mounted on a heavy structural-steel frame. Saw blades can be 12, 14, or 16 inches as desired.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 285.

## Trenching-Machine Points

Literature which describes Weld-On pockets and reversible points for trenching machines has been released by Jiffy Products Co., Inc., 8402 Harry Hines Blvd., Dallas, Texas. It points out that Weld-On pockets strengthen the bucket and eliminate bolt shearing; that the Jiffy quick-change points are self-sharpening, reversible, and self-locking. Pockets and points are available for practically all types of trenching machines. Jiffy cast steel buckets which can also be installed on these machines are briefly described. Each product is illustrated.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 338.

## Hydraulic Equipment

An 8-page folder is available on the line of hydraulic equipment put out by Donnell Hydraulic Co., W. Prairie St., Marengo, Ill. It highlights the Hydro-Pac electric hydraulic pump, made for trucks, tractors, and similar equipment. The literature points out that no power-takeoff connections or special mountings are needed with this unit. Both the 6-volt and the 12-volt models are available with pressure ranges from 100 to 5,000 psi. The catalog includes dimensioned drawings, performance data, and specifications.

The Donnell line of Handy-Lift hand pumps is also presented in the catalog. These pumps are made in three sizes and will handle pressures from 100 to 5,000 psi. High and low-pressure rams for power or hand pumps and many types of power valves are illustrated and described.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 320.


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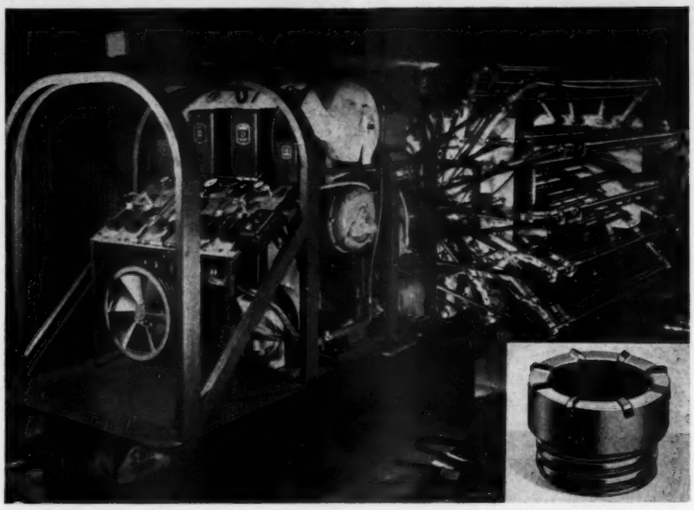
## A New Drilling Unit For Rapid Tunneling

A new development in rock-tunneling machines is the automatic self-contained gang drill designed by Demo-Canon Engineering & Mfg. Co., Inc., 2215 S. Sepulveda Blvd., Los Angeles 25, Calif. It is said to increase tunnel-driving speeds up to 80 per cent and reduce labor costs an average of 92 per cent. Commercial production is planned as soon as the unit has been completely field-tested.

The rear half of the machine is the nerve center. The operator is located in a fully protected enclosed cab where all controls are arranged on a console in approximately auto-dashboard position. Beyond the control panel are the power plant, gear boxes, compressor units, and other integrated components of the machine.

The present experimental model carries its bank of 28 drill rods in a rack-like fixture flexibly connected to the main driving unit. The 15 outside drills may be moved vertically or horizontally to give a pitch variation of 4½ inches in 10 feet from the direction of the drive. The other drills are in a fixed position, parallel to the direction of drive. The entire machine may be mounted on a mine flatcar or suspended from a monorail track attached to the roof of the tunnel.

The gang drill uses Konkrete Kore bits manufactured by Tilden Tool Co., San Clemente, Calif. The drill heads are truncated core shafts with specially treated sintered carbide cutters, stress-relieved. Tilden reports that stress relief has made it possible to use a very hard carbide cutter without introducing brittleness. The bits are of the hollow-core-drilling type, constructed from chrome-moly steel and mounting inset cutting teeth. The hollow steel drill stem has an over-all diameter of 2 inches. Holes are drilled 2⅜ inches in diameter.



Demo-Canon designed this new self-contained gang drill for tunneling. It is said to increase tunnel-driving speeds up to 80 per cent and reduce labor costs 92 per cent. It uses Tilden Konkrete Kore drill bits.

Water and air are fed to the cutting edge of the bit at 200 psi to cool the bit and remove cuttings. The cuttings drop out as core flakes. The length of the drill stroke is 3/32 inch. Demo-Canon reports that drilling speeds of 23 inches per minute have been attained in limestone, quartz, slate, and sandstone. The bits were good for some 700 linear feet. Drill speed is adjustable from 200 to 2,000 rpm to attain maximum efficiency for all rock conditions.

The new gang drill will work the entire face of a tunnel in a single operation to a depth of 10 feet. It will also drive a tunnel 6 feet 9 inches wide with an arched roof having a total height of 7 feet 6 inches. The same type of machine can be used to drive tunnels of other sizes and shapes. Power requirements for the entire machine—tram motor, drill operation, compressor, hydraulic jacks, screw drive, and water pump—total approximately 21½ hp.

The machine may be supplemented with a mechanical wedge which in effect applies distributed breaking pressure inside the drill holes. This is accomplished by air-pressure jack action in which a closely spaced set of hardened-alloy-steel lugs are arranged spirally and are forced outward against the sides of the drill hole at such pressure as to cause rupture and disintegration of the rock.

Further information on this new drilling unit may be secured from the company. Or use the Request Card at page 16. Circle No. 370.

## Joint Fillers and Sealers For Concrete Construction

A 12-page catalog describing various types of expansion-joint fillers, sealing compounds, and other construction materials has been released by Servicised Products Corp., 6051 W. 65th St., Chicago, 38, Ill. It includes complete data on all types of joint fillers such as asphalt, nonextruding Kork-Pak (fiber), cork, self-expanding cork, and Cementone sponge rubber; Para-Plastic hot-poured bituminous-rubber joint-sealing compound for horizontal joints; and Premolded Para-Plastic strips for sealing vertical joints.

Other products shown in this catalog are asphalt plank flooring; corrugated sealing strips for corrugated asbestos, aluminum, and steel; molded and extruded-rubber waterstops for concrete structures; and abrasive safety stair treads and flooring.

This literature is illustrated with photographs, drawings, and data tables. Physical properties and specifications are shown, as well as recommended uses of Servicised products. Additional literature and engineering data may be obtained from the company or by using the Request Card on page 16. Circle No. 262.

## P&H Personnel News

Joseph G. Surmacz fills the newly created office of Chief Industrial Engineer for the Harnischfeger Corp., Milwaukee. He is in charge of production control. David A. Drewery, newly appointed Plant Industrial Engineer, assists Mr. Surmacz.

SAFE!
Smart Money is on Scottie McBlock in the big league.
IT'S ALWAYS SMART TO PUT YOUR MONEY ON A
SUPER CHAMPION
• FOR TOP PERFORMANCE
• REAL ENDURANCE
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McKissick Builds a Better Block
Drop forged, heat treated swivel hook or shackle for super duty . . . 8" - 10" - 12" and 14" steel sheaves, grooved to fit proper line size. Large diameter center pin. High speed bronze bushings or roller bearings. Alemite lubrication.
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THE Quinn Standard FOR CONCRETE PIPE
The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.
Quinn Heavy Duty Pipe Forms
For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.
WRITE TODAY. Complete information, prices, and estimates sent on request.
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NEW!
LIGHTWEIGHT LOW COST TOWER
MODEL III TYPE PT
3,000 LBS. CAPACITY for
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in 117-foot height Less Hoist, Cable
Here's really more for your money in a panel-type tower. Lightweight tubular steel quick to erect (especially in confined places) — is completely assembled with only 11 simplified component parts. Because it's built out of prefabricated panels with integral notch locking mechanism, it requires no bolts or nuts for braces and girts. Available with material platform or concrete bucket and hopper (as shown).
Send for descriptive brochure.
AMERICAN TUBULAR ELEVATOR COMPANY
710 North St., ZELIENOPLE, PA.
Division of UNIVERSAL MANUFACTURING CORP.

# Freeway Billboards Threaten Planting

## Balfour Demands Vandalism Stop and Billboard Alleys Be Prohibited by Stricter Zoning Ordinances

• FRANK C. BALFOUR, Chief Right-of-Way Agent for the California Division of Highways, charged recently that outdoor advertising signs are turning southern California freeways into "billboard alleys". He said that Director of Public Works C. H. Purcell and State Highway Engineer G. T. McCoy will recommend to the California Highway Commission that no more money be allocated to landscape metropolitan freeways until tighter zoning laws are enacted. He said it has been proved in Los Angeles that there is incompatibility between landscaped freeways and billboards on adjacent privately owned property.

In addition, Balfour charged that "somebody" has cut down State-planted trees in front of billboards along the Arroyo Seco Parkway. He said 18 different cases of such vandalism have cropped up since 1946, the latest offense occurring last December 18.

Balfour made his charges during a tour of the Hollywood Freeway and the Arroyo Seco Parkway, sponsored by Los Angeles Beautiful. About 80 men and women, representing 167 affiliated organizations, made the tour in two busses.

### Repeats Charges

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"I have no quarrel with the outdoor-advertising industry", said Balfour. "State Highway Engineer G. T. McCoy is recommending to the California Highway Commission that no further funds be allocated for landscaping the freeways in metropolitan areas until billboards along them are zoned out."

This means that contracts for landscaping freeways, estimated at $25,000 a mile, will be held up until city and county governments pass zoning ordinances banning erection of billboards on property adjacent to landscaped freeways.

Balfour told the 30 civic leaders present at the executive luncheon at the Los Angeles Chamber of Commerce that the billboard industry itself had drafted a stringent control program on the issue in September, 1948, which "died in committee". "Since then," he added, "billboards have appeared in great numbers along the freeways, particularly around Oakland."

He said first reports of vandalism on the Arroyo Seco were made in 1946, when the landscaping was 4 years old. Many of the sycamore and other trees were lopped off at a height of 4 to 5 feet above the ground. In other cases, he said, trees were thinned by pruning out shoots.

"We don't know who's responsible," he said, "but there was not a single tree or shrub molested except where it improved visibility for the billboards."

Though comparatively few billboards have appeared along the Hollywood Freeway between Grand Avenue and Silver Lake Boulevard, Balfour said his study of the Los Angeles zoning map shows there is a danger billboards can be erected in commercial zones every 600 feet along the 4-lane speedway. Presently, city ordinances forbid billboards in areas zoned for residences.

The tour along Cahuenga Parkway showed numerous billboards along the high-speed highway. Balfour pointed out that some of them had been placed on stilts to be visible above the trees.

He cited also the safety factor in relation to outdoor advertising signs.

"Studies by the American Automobile Association and the National Safety Council show that it takes the average motorist 2½ to 3 seconds to read the material on the billboard", Balfour said. "These freeways are built for 60-mph traffic. It takes the average driver a distance of 270 feet to read the sign, and for that 270 feet his car is not under proper control."

The State is so aware of this safety hazard, he commented, that it plans erection of directional signals on freeways so they jut out over the highway, or so close by that the driver doesn't need to take his eyes from the road to read them.

Mrs. Samuel Ayres, Jr., Chairman of the tour, proposed a resolution, which was adopted, calling for creation of a committee to study possible legislation aimed at stricter control of billboard installations along landscaped freeways. When the tour was ended, she quoted:

"I think that I shall never see
A billboard lovely as a tree,
In fact, unless the billboards fall,
I'll never see a tree at all."

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### Plastic-Surfaced Plywood

A catalog on plastic-surfaced plywood has been prepared by Douglas Fir Plywood Association, Tacoma Bldg., Tacoma 2, Wash. It describes the types of plastic-surfaced Douglas-fir plywood, the properties of the overlay panels, and some of the applications in building and industry. Recommendations for machining the panel material are included.

This literature may be obtained from the association, or by using the Request Card at page 16. Circle No. 271.

**Top choice...where performance counts**

● It's no accident that Marmon-Herrington *All-Wheel-Drive* Fords are today's biggest selling multiple-drive trucks. They're top choice with owners because they're tops in performance—tops in dependability—tops in dollar value.

Get behind the wheel of a Marmon-Herrington *All-Wheel-Drive* Ford—see for yourself how live power and traction in all wheels levels steepest hills and mountain grades—feel how those working front drive wheels literally lift you through deep mud, sand and snow . . . even with peak loads aboard.

Then look underneath. Notice how the frame has been reinforced at all critical points. Look at the heavier, stronger springs; the husky, powerful front driving axle . . . all built permanently into each vehicle —right at the Marmon-Herrington factory.

Don't buy any multiple-drive truck until you've seen the new high-speed, high-performing Marmon-Herrington *All-Wheel-Drive* Fords. See your Marmon-Herrington dealer—or write for literature.

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All-Wheel-Drive

Top choice...where performance counts

It's no accident that Marmon-Herrington *All-Wheel-Drive* Fords are today's biggest selling multiple-drive trucks. They're top choice with owners because they're tops in performance—tops in dependability—tops in dollar value.

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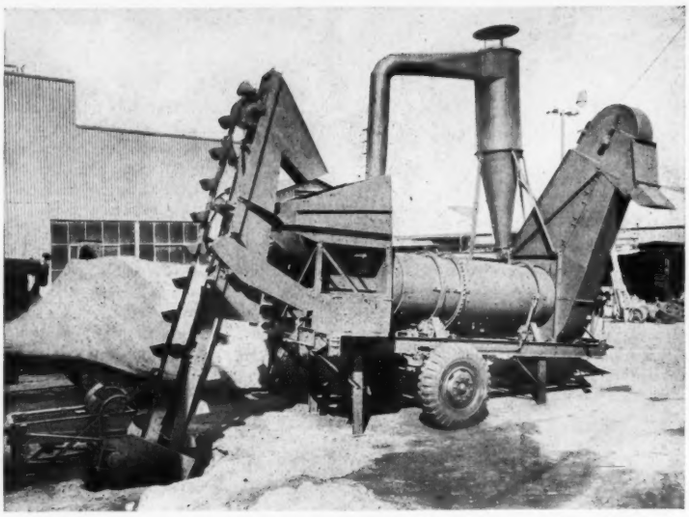
MARMON-HERRINGTON
All-Wheel-Drive
FORDS

## It Must Be Mobile

Ordinarily fixed operations are becoming mobile because of the requirements of defense. Standard Steel Corp., Los Angeles, Calif., for instance, has been awarded a defense contract to fabricate a large number of completely portable aggregate dryers for road and airstrip construction in remote areas.

When the units are set up, a shallow hole to accommodate the foot of the cold elevator is dug at the feed end of the machine. The aggregates go through the feeder and are raised by the elevator to a hopper above the dryer. From the hopper they are gravity-fed into the revolving drum of the dryer which is heated by the same type of fuel which drives the 35-brake-horsepower 1,400-rpm motor. At the discharge end of the dryer the aggregate is picked up by the discharge elevator, which carries it to the discharge spout. A cyclone separates and returns the dust from the hot-air discharge.

For transportation, the main dryer drum, motor, and frame are pulled, as a trailer, behind a regular Army truck. The discharge elevator folds over after the spout has been removed. The truck hauling the main plant trailer also carries the feeder apparatus, duct work, and cyclone.



It looks like a big grasshopper, but it's a portable aggregate dryer which Standard Steel Corp. is making for the Army.

## New Film on Engines

A motion picture portraying the history of power equipment and tracing the origin, growth, and activities of the Brush-Aboe Group of England is available from ABOE, Inc., Suite 7108, Empire State Bldg., New York, N. Y.

Titled "Power", the 16-mm black and white film runs for 30 minutes. It spotlights the introduction of electricity into industry, and describes the early inventions of Charles Francis Brush, founder of the Brush Co. The film tells how the Brush Co. developed the Ljungstrom steam turbine for power generation. It explains how the development of the diesel engine prompted the company to extend its activities and to form the Brush-Aboe group of companies. The manufacturing processes and the products of all factories are shown, from the smallest Petter engines to the 2,880-hp 16-cylinder diesels made by Mirrlees.

The company points out that the engines marketed in this country are for the most part smaller than the American type and offer little or no competition to domestic products.

Copies of the film may be obtained from the company. Or use the Request Card at page 16. Circle No. 253.

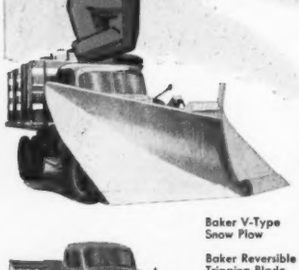
## Data on 22-Ton Rear-Dump

A 16-page catalog covers the rear-dump Euclids of 44,000-pound payload capacity made by The Euclid Road Machinery Co., 1361 Chardon Road, Cleveland 17, Ohio. It describes the Models 31TD and 53TD in detail, and points out that they are equipped with diesel-engine power sources of 286 or 300 hp. Their 10-speed transmissions provide a speed range of 3.1 to 32.4 mph when the rigs are loaded.

The planetary drive axle, transmission, frame, and hoist, are illustrated. General classification data on each model are included and many field photographs show "Eucs" on the job.

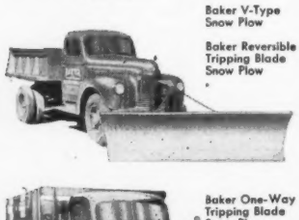
This literature may be obtained from the company by requesting Form No. 120, or by using the Request Card at page 16. Circle No. 265.


"Dad burn it- Ole Man Winter hasn't changed a bit!"

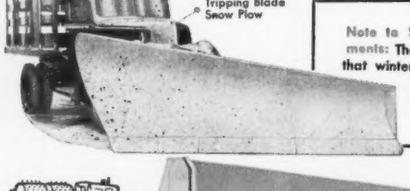


Baker V-Type Snow Plow

Baker Reversible Tripping Blade Snow Plow



Baker One-Way Tripping Blade Snow Plow



Yes, Sir! Grandpa's stompin' mad! These new fashioned winters have put his old fashioned ones to shame. Weather bureau records prove that 1948, '50 and '51 dumped more snow on grandpa's-in-the-making than grandpa ever knew. He's fit to be tied —particularly when grandson rubs salt in his wounds by saying "wait 'til I tell *my* grandchildren about the winters *we* had!"

Note to Street, Highway, Airport Departments: The weather bureau sees no sign that winters will soften up a dad-gummed bit. So, be ready—with Baker Snow Plows—grader, tractor or *truck* mounted.

THE BAKER MANUFACTURING COMPANY • SPRINGFIELD, ILLINOIS



HARD PACKED CLAY couldn't stop this
McKIERNAN-TERRY PILE HAMMER

To drive 2,127 piles for the foundation of the concrete spillway at a new Texas dam, the contractors, Reynolds & Williams and Noonan Construction Co. selected a powerful, fast-driving McKiernan-Terry 11-B-3 Double-Acting Pile Hammer. • The complete McKiernan-Terry line of 16 sizes of double-acting and single-acting pile hammers and 2 sizes of double-acting pile extractors provides exactly the right unit for every requirement • Contractors all over the world have learned from experiences like this that McKiernan-Terry Hammers can always be depended upon for speedy economical pile-driving jobs. Write for bulletin.

McKiernan-Terry 11-B-3 Double-Acting Pile Hammer helping to build the foundation for the concrete spillway of dam on Neches River, Texas, to store 94,200 acre-feet of water.

MK 292 A

McKIERNAN TERRY

McKIERNAN-TERRY CORPORATION
*Manufacturing Engineers*
19 PARK ROW, NEW YORK 38, N. Y.
*Plants: Harrison, N. J. and Dover, N. J.*

COAL TOWERS

TRANSFER BRIDGES

HONING TO 42" I. D.

GRAB BUCKETS

## Announce PM Program For Truck Operators

A revised preventive-maintenance program for trucks has been set up by GMC Truck & Coach Division, General Motors Corp., 660 South Blvd., E., Pontiac 11, Mich. It covers many types of trucking operations and ties in closely with modern equipment and trucking methods.

The new program has an A service for gasoline-powered vehicles that have been driven either three to six weeks or 1,000 to 3,000 miles (depending on the type of operation), and a B service for trucks driven either three to six months or from 10,000 to 20,000 miles. For diesel trucks, the two services are placed in effect after somewhat longer periods of operation.

The service intervals have been lengthened and vehicle time in the shop has been reduced by the new system, although more service work is performed at each interval, the company says. Maintenance work done on a particular truck is recorded on a single sheet. A glance will show the history of the truck, and this method is a good check on driver deficiencies. One of the important benefits in the PM program, GMC says, is accurate scheduling of maintenance work. Other merits include lower maintenance cost per mile, reduced road delays, more efficient equipment, and more accurate estimates of truck-operating expenses. Maintenance costs in some fleets that have used the GMC preventive-maintenance program have been cut as much as 50 per cent, the company claims.

There is a new PM agreement form for operators who have only one or two trucks, or a small fleet. Under this agreement, the dealer does the work and keeps the records, letting the owner know when some special work is required.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 356.

## New Modular Office Features Flexibility

A development in modular office equipment may be of interest to the contractor with a space problem. The Techniplan line made by The Globe-Wernicke Co., Cincinnati 12, Ohio, is flexible and compact. Arrangements are built around desk and center runners assembled with various standard sectional units for letter files, map and drawing cabinets, and card-index cases. Many setups are possible. A patented, interlocking feature makes assembly and rearrangement easy.

Two of the many possible combinations of Techniplan sectional office equipment.

The units have concealed waste baskets and electrical connections for integral fluorescent trough lighting, business machines, inter-com systems, and telephones. Partition combinations can be arranged to secure semi or complete privacy. They are made in two heights in all-wood or wood and glass. All modular units including partition sections have leveling adjustments to compensate for unevenness of the floor.

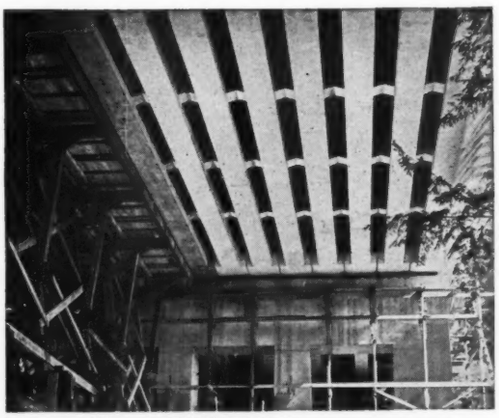
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 336.

## Literature on Hand Winches

A 4-page folder on a line of hand hoists in 2, 5, and 15-ton capacities, made by Beebe Bros., 2724 Sixth Ave., S., Seattle 4, Wash., has been released. It describes each unit, illustrates models, and tabulates drum capacities, drum sizes, and installation and shipping data. The features said to make the Beebe hand hoist unbreakable in hand operations are described in detail.

The 2-ton hoists are available in two drum sizes and have two speeds of operation. The 5-ton general-utility hoist is available in four sizes and has two speeds of operation. The 15-ton hoist may be operated at three different speeds.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 289.



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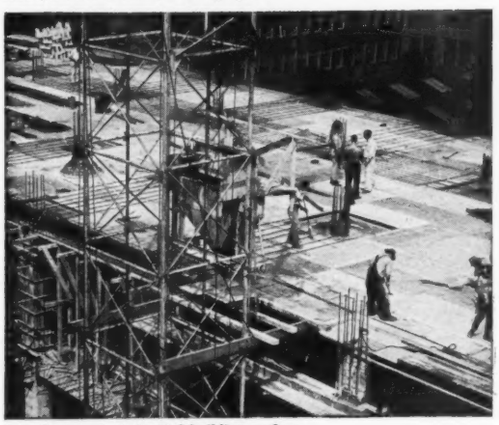

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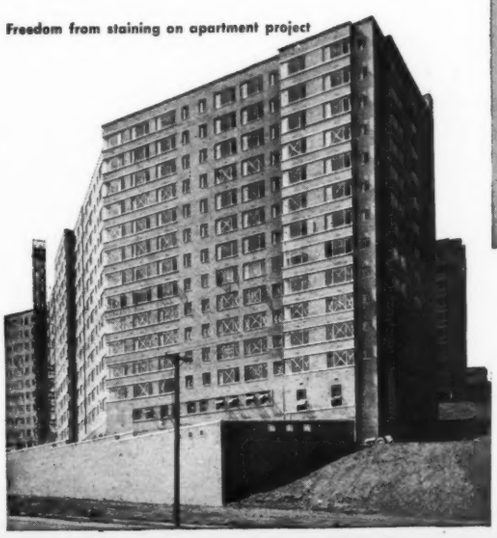

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# Steam Power Station

Here's how the site for the Albany Steam Station looked at the start of construction. Bates & Rogers used a rented Lima 802 dragline for the bulk of the digging. Because of the nearby Hudson River and naturally wet soil, a wellpoint system had to go in.

## New Niagara Mohawk Plant on Hudson River Has 160,000-Kw Initial Capacity, With Facilities for Further Expansion

(*Photo on page 1*)

• INCREASING demand for electric light and power in upstate New York will be satisfied to a great extent with the construction of a new steam-electric generating station for the Niagara Mohawk Power Corp. The power plant, located on the west bank of the Hudson River about 3 miles south of Albany, will have an initial capacity of 160,000 kw.

Stone & Webster Engineering Corp. of Boston, Mass., is managing the construction of the station at an estimated cost of $27,000,000. Construction got under way in September, 1950, and the two units in the initial phase of the development will be in operation in 1952. Units 1 and 2 are each rated at 80,000 kw. A third 80,000-kw unit will be started some time this year, and is expected to be put in service in 1953.

The plant is being built on a tract of land approximately 1,600 feet wide east and west, between State Route 144 and the river, and approximately 1,800 feet north and south. The area north of the station will be used for coal storage and ash disposal. The site is served by a spur track, ¾ mile long, off the West Shore Branch of the New York Central Railroad. Suppliers of construction materials deliver their wares to the project over this spur which will also be used for hauling coal into the station. Grading for the roadbed of the spur was done by the Callanan Road Improvement Co. of Albany, and involved some heavy rock cut at the north end of the property. The track was laid by the Fred Ballard Construction Co. of Syracuse, and the spur was finished preceding the start of heavy construction at the building site.

*C.&E.M. & Niagara Mohawk Power Corp. Photos*

Massive RC piers transfer the weight of the heavy structure to the underlying bedrock. Elmhurst Contracting Co. built the substructure, using a Northwest crane and a Lima to handle the concrete buckets to the pier forms.

### Excavation

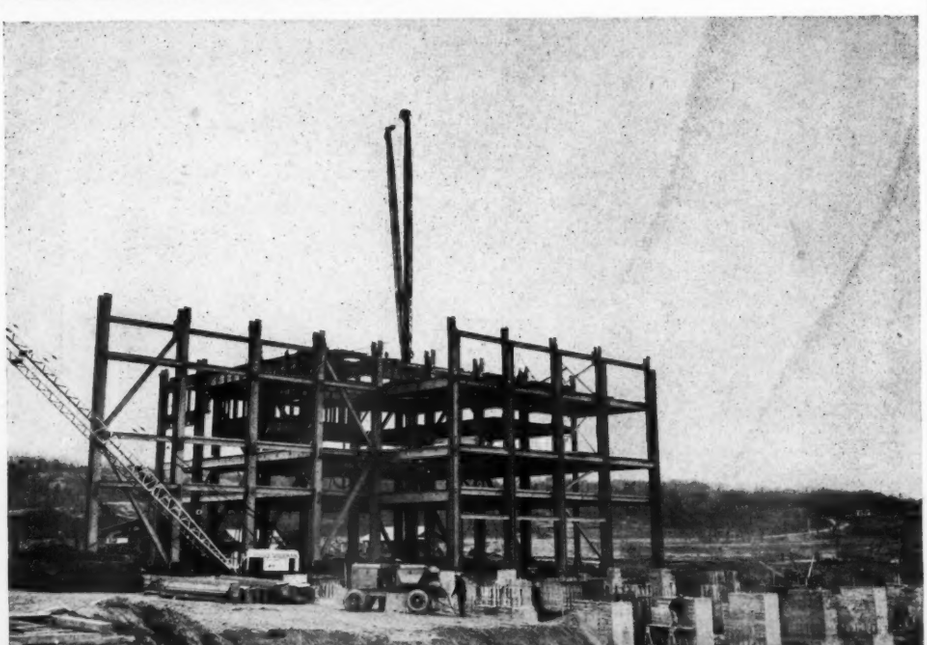
For units 1 and 2, the station is built with a width of 222 feet 9 inches measured east and west, x a length of 175 feet 4 inches from north to south. The east side of the structure is only 500 feet back from the Hudson River, which will supply the necessary water for operations through intake and discharge tunnels. The boiler room will take up slightly more than half of the station at the west end of the building, running the full length of 175 feet 4 inches and having a width of 121 feet 5 inches. Its height is 162½ feet. Adjoining the boiler room to the east is the 101-foot 4-inch x 175-foot 4-inch turbine room with a height of 94 feet.

Additional units will be added along the south side of the plant. Unit 3, for instance, will require three additional bays of 21 feet 4 inches each, totaling 64 feet, and the full building width of 222 feet 9 inches.

Bates & Rogers Construction Corp. of Chicago had a subcontract for foundation excavation which was finished by the middle of November last year. The bulk of the digging was done with

(*Continued on next page*)

Here some of the piers have been poured, and a jackhammer excavates shale rock for the turbine-room foundation.



In the foreground, completed concrete piers for the turbine room, and in the background, steel going up for the boiler house. Bethlehem Steel Co. handled steel construction.

# On Piers Into Rock

a crawler rig of the Vanderwater Contracting Co., Inc., of Liverpool, N. Y. The excavator—a Lima 802 dragline equipped with a 70-foot boom and a Hendrix 2½-yard bucket—either cast the material from the hole up on the bank, or loaded it into Tournarockers for hauling away. The excavated material helped to form an earth dike that completely encircled the building site. The dike was built to substantial dimensions with a top width of 40 to 50 feet that served as a working platform during the construction; its height ranged from 8 to 10 feet.

### Wellpoints Required

The ground at the site had been built up to the existing level when the river had been dredged over three decades ago. Hydraulic fill in the form of heavy clay and silt had been pumped out on the flat river bank as spoil from the channel cut. Underneath this overburden is solid rock that had been given the name of Dominic's Hook because of its characteristic ridge formation. In places at the high point in the ridge, the rock protruded from the ground as outcroppings. The depth of overburden increased gradually as the rock dropped off.

Because of the proximity of the river, and the naturally wet soil carrying the drainage of the valley, a wellpoint system was essential to dewater the site during the foundation work. As the hole was dug, a Moretrench wellpoint header line was laid on all four sides of the site about 12 feet below ground level. The east side, paralleling the river, took a 10-inch header, while on the other three sides the header line was 8 inches in diameter. Risers spaced on 5-foot centers went down 24 feet into the wet soil. Two 10-inch pumps were assigned to the dewatering; one pump kept the area dry, the other being held in reserve as a standby.

Working in the dry, the contractor excavated about 50,000 cubic yards of material for the building foundation. The average depth of cut down to rock was 20 feet. Enough working space was available to lay the sideslopes back on a flat angle, thus eliminating the use of sheeting. Later, when the deep parts of the concrete foundation were poured, three of the four header lines on the north, west, and south sides were removed. The line on the east side, closest to the river, was left in place and functioning until the foundation was completed throughout.

### Concrete Pier Foundations

Massive reinforced-concrete piers, 50 feet deep in places, transfer the weight of the heavy structure to the underlying bedrock. The Elmhurst Contracting Co., Inc., of Elmhurst, N. Y., built the substructure of the station. Rock excavation totaled 1,900 cubic yards in leveling off high spots in the ridge, removing unsuitable shale, and digging into bedrock at least 2 feet as an anchor for the piers. Drilling and blasting of the ridge top was done by the Curley Construction Co. of Albany, but no blasting was done for the pier seats in the rock. Such holes were cut out by jackhammers since dynamiting might have jeopardized other work in progress at the site, or damaged piers that had already been built or were under construction.

On the rock work the contractor employed 4 wagon drills, 8 jackhammers, and 2 500-cfm air compressors. Markley dust collectors were on hand to draw off the stone dust created by the drilling. In addition to the piers being seated at least 2 feet into rock, they were also anchored with 2-inch dowels that were grouted into drill holes at least 8 feet deep, with the corner dowels going 6½ feet farther into the rock. Each pier averaged eight such anchor dowels. At the deep corner holes for the dowels, the grout was put in under pressure and carefully measured as a check on any cavities or seams. No trouble was encountered, however, with loss of grout, indicating that the rock was solid throughout the foundation area.

A total of 82 piers support the structure. They range in size from 4 feet x 4 feet 6 inches, up to 14 feet x 14 feet 6 inches. The smaller piers are few in number, and are designed mainly for floor support. Most of the piers are close to the maximum size to take the load of the heavy steel columns.

### Walls and Slabs

The rest of the substructure is correspondingly heavy. Boiler-room founda-

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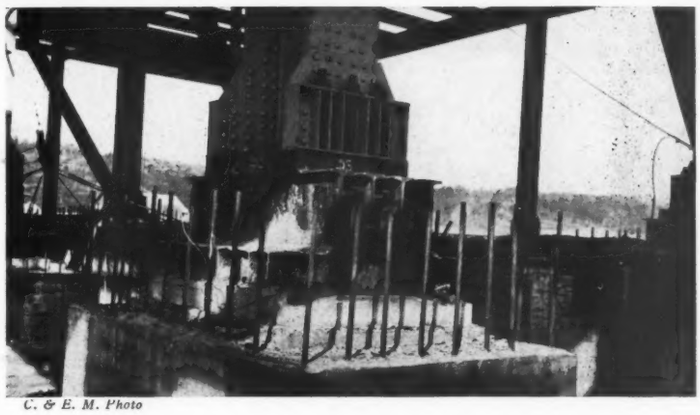

*C. & E. M. Photo*

**A typical pier and column is D3, in the boiler room. Note the double grillage in the massive foundation, and the heavy anchor bolts going into the concrete pier.**


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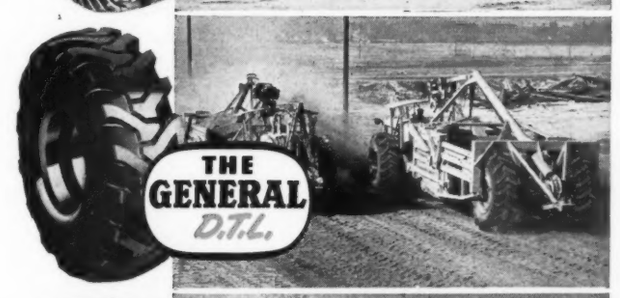


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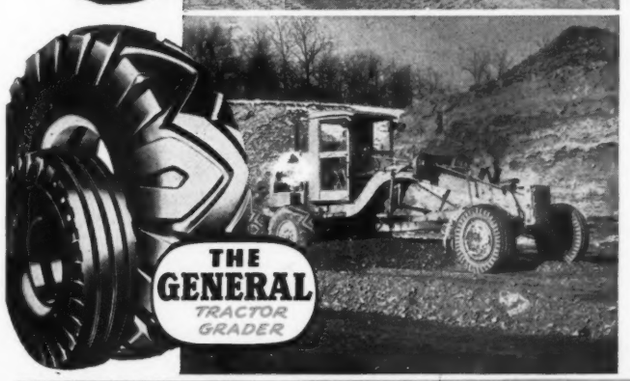


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## Steam Power Station On Piers Built in Rock

*(Continued from preceding page)*

tion walls, for instance, are from 3 to 3½ feet thick x 11 feet deep. Turbine foundation slabs measure 29 feet x 68 feet 6 inches in area, x 7½ feet in depth for turbine 1 and 6 feet in depth for turbine 2. Reinforcing steel for the substructure totals about 633 tons, and was supplied by the Truscon Steel Co. of Buffalo. Transit-mix concrete came from the Ready-Mix & Supply Corp. of Albany which has a plant 5 miles from the job site. As many as ten 6-yard truck mixers delivered concrete when the large pours were in progress.

Forms were built with either 1 x 6 or 1 x 8 sheathing, backed with 2 x 4 studs on 16-inch centers, and double 2 x 6 wales on an average of 2-foot centers. Richmond ties held the panels together. Where possible—as for the slab and heavy beam pours—the truck-mixers chuted the concrete directly into the forms. In the boiler room the beams averaged 42 inches wide x 60 inches deep to support an 18-inch floor slab. In pouring the piers, the mixers discharged into 1-yard buckets which were handled by a Northwest and a Lima crane equipped with 65 and 100-foot booms respectively. Six Mall vibrators were available to vibrate the concrete as it was placed.

During winter pours the aggregate and water for the batches were heated, and after the concrete was placed, the forms were protected with tarpaulins and salamanders. The past winter in Albany was wet, but severe cold spells were of short duration and the work was not delayed unduly by the elements. Careful check was kept on the temperature of the concrete after it was placed. After the forms were removed, a thermometer inserted about 2 inches into the hole left by the tie showed an average temperature of 90 degrees F. Concrete work started last November and continued throughout the winter.

### Steel Framework

In January of this year the Bethlehem Steel Co. moved in on the job to begin steel erection on the structural framework. Approximately 5,000 tons of steel were required and were fabricated at the Buffalo, N. Y., plant of Bethlehem and delivered to the site by rail. At the yard a Manitowoc 50-ton Speedcrane with a 50-foot boom unloaded the members and stockpiled them for use when wanted. The initial work took in the setting of the heavy steel grillages for the columns supported on the big concrete piers.

A typical pier and column, D3 for example, has a 5½-inch steel base plate resting on a top tier of four 20-inch beams, supported on a lower tier of nine 15-inch beams laid in the opposite direction. Measured at the base the grillage is 6 feet 6 inches x 4 feet 6 inches, and is representative of the heavy construction required for the boiler room. The column is a builtup section with a 24 x 2¼-inch cover plate, and is 63 feet 8 inches in height for the first lift. It is anchored to a pier with a top area of 7 feet 6 inches x 11 feet, and a 14-foot x 10-foot 6-inch footing. Six 2½-inch anchor bolts, 17 feet in length, extend deep into the concrete pier to tie the steel column in place.

The grillages were carefully set with leveling screws used in the adjusting; the screws were backed off when the grout started to harden. The grout used in the column bases and grillages consisted of one part high-early-strength cement and 2½ parts of fine aggregate. In the turbine room the column loads were taken by base plates without the need of the heavy grillage.

### Three Derricks Used

Once the grillage and base plates were in place, the steel erection progressed steadily. In the beginning, a Lima 60-ton crawler rig with a 100-foot boom and a 25-foot jib raised the steel in position. As the building went up, a derrick was installed to handle the higher members. Later two other derricks were set up, all in the boiler-room section. The three derricks have 90-foot booms and 100-foot masts and are controlled by hoists employing two of the three drums for lift and swing.

Field connections are riveted except in a few locations where conditions do not permit; at such places Dardelet rivet bolts are used. Rivets are 1⅛ inches and ⅞ inch in size. Four crews working from floats do the riveting, with the air supplied from one 500-cfm compressor. The heaviest members, 64-foot lengths of builtup columns, weigh 27 tons.

In the boiler room the columns measure 64½, 62½, and 37 feet for the first, second, and third legs respectively from bottom to top. In the turbine room the roof trusses are supported at one side by these columns. The trusses are 10 feet 7 inches deep at the ends. Crane rails in the turbine room are 97 feet apart on centers. The boiler room has floors at eight different levels above the ground.

### Future Contracts

During the steel and concrete work a force averaging 200 was employed on the project. This number will increase as additional contracts are let for subsequent phases of the work. Future

*(Concluded on next page)*


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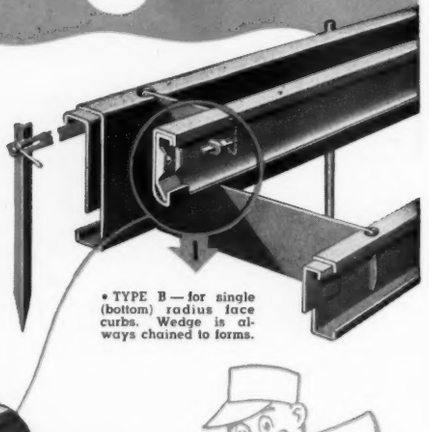
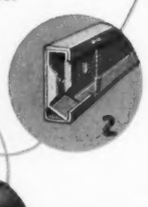


• TYPE B — for single (bottom) radius face curbs. Wedge is always chained to forms.



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contracts will cover the laying of the red-brick walls for the superstructure, floor slabs, roof, stacks, tunnels, and flumes.

Project personnel on these initial contracts include Frank Fogg, Superintendent for Bates & Rogers Construction Corp.; C. H. Batchelder, Project Manager, and B. Nielsen, Superintendent for the Elmhurst Contracting Co.; and William Roup, Superintendent for the Bethlehem Steel Co.

Construction of the Albany Steam Station is being managed by Stone & Webster Engineering Corp. The plant was designed by the Engineering Department of Niagara Mohawk Power Corp. under the direction of E. S. Bundy, Vice President and Chief Engineer.

## Tip on Maintenance

For the swipe files of maintenance men, who frequently must get along with reclaimed parts, All-State Welding Alloys Co., Inc., 273 Ferris Ave., White Plains, N. Y., offers the following information.

Phosphor bronze arc welding used in maintenance work and repair is generally characterized by pitting and porosity, the company says. In many applications this is of no consequence, but where a smooth surface is essential—as in the case of bearings and parts which have to be corrosion-resistant—pitting and porosity are undesirable. In these instances a smooth face can be obtained by "surface washing" with All-State No. 23 phosphor-copper-silver brazing rod. This rod can be "washed" on with a neutral or excess-acetylene flame, or with a Prest-O-Lite torch or oxyacetylene gas flame. It has a 1,270-degree F working temperature. When molten it flows into the cracks and pits and bonds them, All-State says. A No. 21 Brazaloy flux is used in applying this rod.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 325.

## Self-Propelled Spreader

A 12-page illustrated catalog on its paver-type aggregate spreader is available from The Jaeger Machine Co., 701 W. Spring St., Columbus 16, Ohio. This self-propelled machine is designed to lay accurately both base and surface aggregates, free-flowing hot and cold bituminous mixtures, and plant-mixed stabilized soil.

The booklet describes and illustrates the machine's use on many types of work. Close-up photographs show its construction features, and specifications are included. The company points out that the paver-type aggregate spreader lays widths up to 12 feet 6 inches, depending on the thickness of application. It will lay in thicknesses up to 10 inches, depending on gradation of material, width of lay, and speed of operation. Both crawler and 4-wheel drive are interchangeable to meet job conditions. Jaeger says the unit has enough tractive power to push supplying trucks.

This literature may be obtained from the company by requesting Catalog SPS-1, or by using the Request Card at page 16. Circle No. 287.

## New Offices for Eutectic

To consolidate the branches of the company in and about the New York metropolitan area, Eutectic Welding Alloys Corp., has constructed an administration building in Flushing, N. Y. The structure, which covers an acre adjoining the large manufacturing plant Eutectic built last year, will be used for the general and executive offices and the Eutectic welding school.

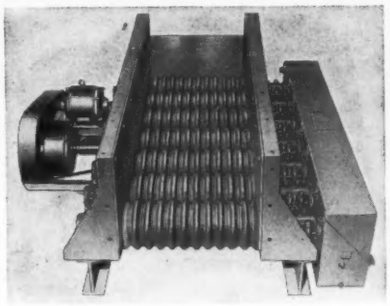
Over 200 persons were present at the dedication and inaugural ceremonies, including local dignitaries, members of the firm, and leaders in the welding industry. J. P. Hughes Wasserman, father of Eutectic's president and founder, came from Switzerland to attend.

Among the celebrities were Dagmar, NBC television star, who was named "Miss Welder of 1951" by the National Eutectic Welders' Club at the ceremony.

## Data on Portable Hacksaw

A new folder and operating manual on a portable power hacksaw which attaches to either a ¼ or 5/16-inch heavy-duty drill has been released by Tri-Saw Corp., 6611 Clayton Road, St. Louis 17, Mo. The Tri-Saw features one-shot lubrication, replaceable high-speed bearings, and a complete line of blades for all types of cutting, including wood, sheet metal, heavy metal, nails, pipe, etc. It can cut into floors and walls without a starting hole.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 376.

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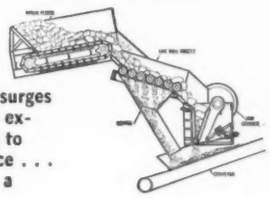

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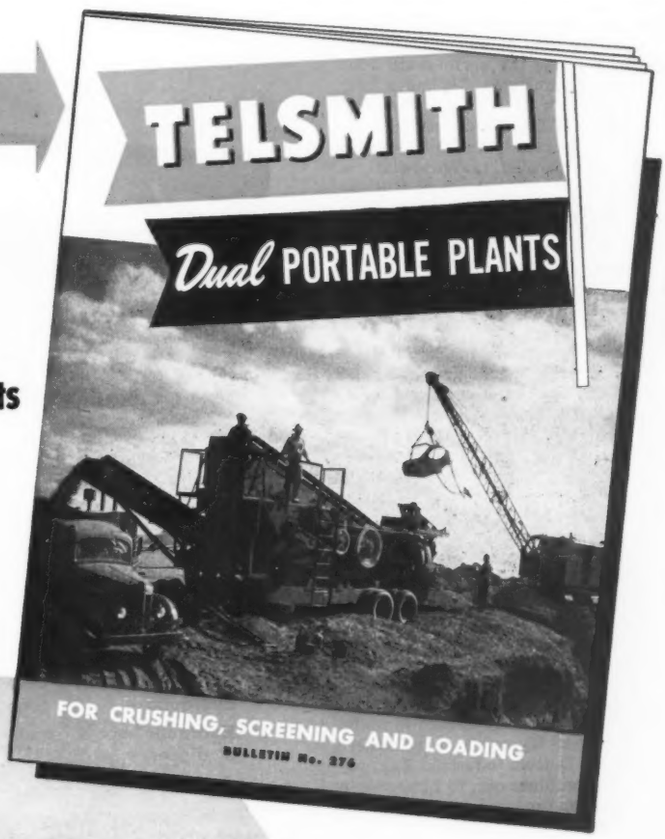


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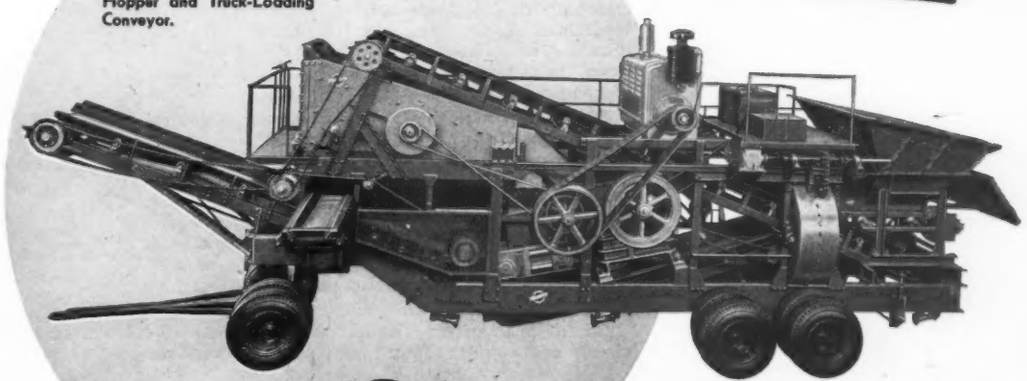

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# Detroit Expressways Under Construction

## Contracts Are Divided Into Short Sections; Typical Concrete Paving of Dual 36-Foot Roadways

• THE traffic problem in Detroit, the country's fifth-largest city, will be eased considerably when the two major expressways now under construction are finished. While the scheduled date of completion is not until 1955 some manner of relief is expected by opening up sections of the expressways as they are constructed. The two expressways now under way have a total length of 9 miles. Future extensions are programed, but are still in the planning stage.

The east-west Edsel Ford Expressway, 5½ miles long, begins at the westerly limits of the city near the Dearborn-Detroit line, and cuts eastward across the thickly settled motor capital. It meets the north-south John C. Lodge Expressway, 3½ miles long, at an intricate interchange that will cost around $6,000,000 to construct. The Lodge Expressway runs south, west of and nearly parallel to Woodward, as far as Jefferson near the Detroit River. Thus motor vehicles will be able to drive from downtown Detroit over the two expressways to the city line where they connect to the Detroit Industrial Expressway and the Willow Run Expressway System west of the city in Wayne County.

Most of the new expressway mileage is in depressed sections with divided pavements, limited access, and other features of a modern urban highway that eliminates crossings at grade with overhead structures. The construction was divided into many short contracts to assure quick completion of the work. Altogether some 64 projects are involved on the two expressways which are expected to cost around $80,000,000, including approximately $30,000,000 for the right-of-way.

### Typical Contract

Construction got under way three years ago, and the first section of the Edsel Ford Expressway at the extreme western end is already opened to traffic. It begins near Wyoming, at the eastern end of the Detroit Industrial Expressway, and continues east to Livernois. A short section on the John C. Lodge Expressway, north of the big interchange, is also in service, running from Holden north to Pallister. The customary procedure has been to award separate contracts for the grading and drainage, bridges and major structures, and for paving.

Money for the extensive urban improvement comes from four sources—Federal, 50 per cent; state, 25 per cent; city, 12½ per cent; and county, 12½ per cent. Work on the contracts is supervised by the Michigan State Highway Department and the Wayne County Road Commission. At the present time all phases of construction—grading, bridges, and paving—are in progress on several sections of the expressways.

A typical section recently completed on the John C. Lodge Expressway is a 3,000-foot strip between Holden and Seward, north of the interchange at the junction of the two urban routes. Depressed throughout, the expressway goes under four structures—two carrying streets, West Grand Boulevard and Milwaukee, and two railroad bridges, Michigan Central and Grand Trunk. These overheads were built under separate contracts—so was the grading, which was done by the Garvaglia Construction Co. of Centerline, Mich., under a joint contract with Denton Construction Co.

### Dual Concrete Pavements

Paving of this portion was awarded by the Michigan State Highway Department to the Denton Construction Co. of Detroit on a low bid of $649,000. The concrete paving was completed in a little over a month's time last summer. The roadway consists of two 36-foot reinforced-concrete pavements, 10 inches thick, and flanked by a concrete curb and gutter on each side. On the outside edge the curb and gutter is 18 inches wide, while on the inside it is 24 inches in width. The interior lines of curb and gutter border a 10-foot raised median that separates the opposing lanes of traffic. The pavement has a 2½-inch modified parabolic crown.

Under the pavement is a sand-gravel base course, 16 inches deep, which was

(Continued on next page)

C. & E. M. Photo

**A Rex 34-E dual-drum paver and a string of finishing equipment work on a section of the Lodge Expressway, Detroit.**


NOW---A COMPLETELY

The New BUCYRUS-ERIE HYDROHOE

★ Two separate digging actions
★ Eliminates up to 40 percent time lost moving up
★ No bails, sheave blocks or drag ropes to interfere with loading
★ Digs a level trench — reduces hand trimming, no scallops
★ Precision control — every work function fully hydraulic
★ Hydraulic ejector assures fast, clean dumping of dipper
★ Travels up to 50 mph. on open highway

Here is a completely new idea in dragshovels for trenching and related digging — the Bucyrus-Erie Hydrohoe. Every operating function is fully hydraulic — boom hoist, swing, dipper dig and dump, boom telescope, outrigger set and retract, and positive dirt ejector.

The Hydrohoe is the only dragshovel with two separate and distinct digging actions. The first is through a hydraulic ram located between boom and dipper handle. The second digging action comes from telescoping the boom. This exclusive telescope feature eliminates moving dragshovel back and forth when digging out boulders and excavating across pipe and cable . . . permits digging a level, scallop-free trench, greatly reducing hand trimming.

Control is so precise, Hydrohoe can operate efficiently and safely around buried pipe and conduit. Dipper can be moved a fraction of an inch if necessary.

Available with interchangeable 18-in. and 12-in. wide self-discharging dippers, the Hydrohoe is adaptable to a wide variety of digging and trenching jobs.

*Write today for full details. We'll be happy to arrange a demonstration.*

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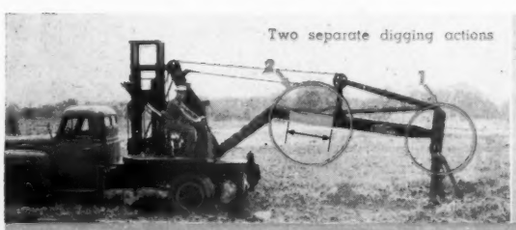
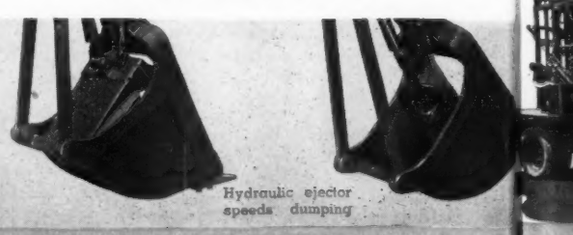
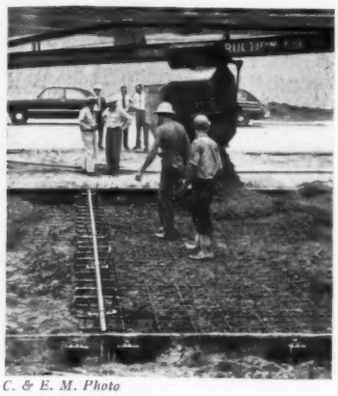
SOUTH MILWAUKEE, WISCONSIN




HYDROHOE - - - A NEW MONEY MAKIN



C. & E. M. Photo

**Between Metaforms, an expansion joint on the Lodge Expressway. A batch of concrete goes in on top of the mesh.**

laid and compacted under the grading contract. Down the median strip and the outside edge of the pavements are open-joint sewer lines laid in porous backfills. Other drains are located beneath the roadways in some locations. Sideslopes in the depressed sections are either 2 to 1 or 2½ to 1.

On this job the paving was laid in two lanes, 24-foot on the inside and a 12-foot lane on the outside. Transverse contraction joints are 99 feet apart, with expansion joints used only at the beginning of curves, access ramps, and end of curves. Pavement for the access roads consists of a 9-inch concrete base course topped by bituminous-concrete surfacing.

### Batch Plant

A batch plant was set up on a lot at the south end of the project, with three separate Butler bins laid out in a row. Two sizes of stone for the coarse aggregate were stored in a 50-ton 2-compartment bin. At the other end of the lot was a 50-ton sand bin. Between the two, bulk cement was kept in a hopper bin and silo having a combined capacity of 550 barrels. The aggregate bins were charged by a Koehring 604 crane with a 60-foot boom and an Erie 2-yard clamshell bucket.

Bulk cement, air-entrained at the mill with Vinsol resin, was furnished by the Peerless Portland Cement Co. of Detroit, and delivered to the job in tank trucks. The American Aggregates Corp. supplied the sand and stone from its plant in Oxford, Mich., about 35 miles north of Detroit. Delivery was made by truck. Dry batches were hauled to the paver in seven of the contractor's International K7 trucks holding two batches each.

C. & E. M. Photo

**A Dotmar curb-finishing machine works on the expressway, with concrete supplied by a Jaeger 4¼-yard truck mixer mounted on a Mack.**

Two trailer tanks, of 2,700-gallon capacity each, supplied water to the paver from city fire hydrants. An International truck hauled them to the project, and as soon as one was empty, it was refilled at a hydrant and returned to the paver. The tank trucks were not pulled along with the paver since a 500-foot length of 2-inch hose was available for transferring the water. One tank truck held enough water for paving 100 linear feet of 24-foot pavement. A Rex pump on the trailer pumped the water from tank to paver.

### The Mix

A 7⅓-bag batch of concrete was used throughout, with an average of 4 gallons of water required for every bag of cement. Weights of a typical batch, with the added water found necessary after checking the moistened aggregate, were as follows:

| | |
|---|---|
| Cement | 689 lbs. |
| Sand | 1,645 lbs. |
| No. 4A stone | 1,505 lbs. |
| No. 10A stone | 1,540 lbs. |
| Added water | 22 gals. |

Gradation of the aggregate used in the mix was as follows:

| | Per Cent Passing | | |
|---|---|---|---|
| Sieve Size | No. 4A stone | No. 10A stone | Sand |
| 2¼-inch | 100 | ..... | ..... |
| 2-inch | 95–100 | ..... | ..... |
| 1½-inch | 65–90 | 100 | ..... |
| 1-inch | 10–40 | 95–100 | ..... |
| ½-inch | ..... | 35–65 | ..... |
| ⅜-inch | 0–5 | ..... | 100 |
| No. 4 | ..... | 0–8 | 95–100 |
| No. 8 | ..... | ..... | 65–95 |
| No. 16 | ..... | ..... | 35–75 |
| No. 30 | ..... | ..... | 15–55 |
| No. 50 | ..... | ..... | 10–30 |
| No. 100 | ..... | ..... | 0–10 |

The specifications required that not more than 3 per cent of the sand be lost by washing.

### Sequence of Operations

The sand-gravel base course was brought to grade by an Austin-Western motor grader, after which Metaforms were set to proper line and grade. Some 5,000 linear feet of steel forms were available on the job. Fine-grading was done by an R-B Finegrader which pulled itself along the forms with cables anchored ahead, cutting the required crown in the base course. In paving the 24-foot lane, the Rex 34-E dual-drum paver with a 32-foot boom worked outside the forms in the median strip. After a 60-second mixing period, the concrete was dumped on the base in front of a heavy steel-mesh strike-off, pulled along over the forms by an Allis-Chalmers HD-5 tractor. The tractor moved slowly forward between the forms, pulling the strike-off by cables.

*(Concluded on next page)*

HYDRAULIC DRAGSHOVEL
★ Quickly convertible to crane in the field for handling buckets, forks, magnet and crane hooks.
FRONT-END FOR THE VERSATILE HYDROCRANE

## Detroit Expressways Under Construction

*(Continued from preceding page)*

In this way the concrete was leveled off 3 inches below the top of the forms for the placing of the mesh reinforcing supplied by the American Steel & Wire Co. At the joint locations a felt strip was placed on the ground and covered with a wooden box with a closed top laid transversely across the lane. The box was just below the level of the steel mesh, and after the strike-off had passed, the box was removed. This left a slot in the concrete for inserting the joints and their assemblies.

Ceco Steel Products furnished the joint assemblies that supported 1¼ x 15-inch dowel bars on 12-inch centers. At the expansion joints the dowels go through a 1-inch thickness of impregnated fiber that is kept from ½ to ¾ inch below the top of the concrete. During the mechanical finishing operations the joint was covered with a metal cap. Longitudinally the slabs are tied to each other, and also to the adjoining concrete curb and gutter, with ½-inch x 4-foot tie bars spaced on 40-inch centers.

### Concrete Finishing

After the joints were installed following the passage of the rolling strike-off, more concrete was dumped on top of the steel mesh and to fill up the slots at the joints. A Jaeger-Lakewood dual-screed finishing machine leveled off the concrete even with the top of the forms. Behind that came a Koehring Longitudinal Finisher, after which the surface was checked with long-handled straightedges. A pair of Jackson vibrators mounted on the rear of the transverse finisher vibrated the concrete along the forms.

Down the center of the 24-foot pavement a center-line joint was cut with a Flex-Plane machine from which premolded joints were installed in the upper layer of concrete. The joint material came in 5-foot strips 2½ inches deep x ¼ inch in width; the strips are flush with the top of the pavement. From this same machine, steel strips were inserted into the transverse joints, and left there until the concrete set up. Finishers then removed them, and edged around the joints with a ¼-inch-radius tool.

Hand floating was done with an aluminum channel section, 6 inches wide x 4 feet long, fastened to a long handle. After a burlap drag was pulled over the surface of the pavement, the concrete was cured by applying a film of Truscon opaque membrane compound with DeVilbiss spray equipment mounted on a Flex-Plane carriage. The joints were poured later with a U. S. Rubber Co. compound heated in a Sealz-Melter unit.

On the 24-foot lane the contractor averaged 900 linear feet of pavement in an 8-hour day. In pouring the adjoining 12-foot lane, the paver worked from the slabs already laid.

Curb and gutter work was subbed out to the firm of Brighton & Wing of Detroit. Transit-mix concrete was purchased from the Cooper Supply Co. of Detroit, and delivered to the job in Jaeger 4½-yard mixers mounted on Mack trucks. The concrete was chuted into steel forms, and the rolled curb quickly placed with a Dotmar curb-finishing machine. This unit moved on short sections of rail that were moved ahead as it advanced.

### Quantities and Personnel

Major items on the job included:

| | |
|---|---|
| Concrete base course, 9-inch | 9,262 sq. yds. |
| Concrete pavement, 10-inch | 26,624 sq. yds. |
| Reinforcing mesh | 23,141 sq. yds. |
| Bituminous-concrete surfacing | 1,584 tons |

The Denton Construction Co. employed an average force of 50 on the project. Charles Leduman is General Superintendent of the contracting firm, while Milton C. "Mickey" Palmer was Job Superintendent and Sy Boissoneau Assistant Superintendent.

Leo Crane was Project Engineer representing the Wayne County Road Commission. Road construction of the expressways is under the general supervision of C. H. Brown, Metropolitan Engineer of the Michigan State Highway Department. The Department is headed by Charles M. Ziegler, Commissioner, with Harry C. Coons, Chief Engineer and Deputy Commissioner.

*C. & E. M. Photo*

**Snapped on the Lodge Expressway contract (left to right) Assistant Construction Engineer C. B. Laird, Metropolitan Engineer C. H. Brown, General Superintendent Charles Leduman, and Contractor Leet Denton.**

## W. A. Horthy Retires

William A. Horthy, research engineer at the Melrose Park, Ill., plant of the International Harvester Co., retired on April 6 after 41 years with the company. Mr. Horthy was a draftsman in the original Harvester tractor works, a garage on the southeast corner of Western and Blue Island Avenues in Chicago. He now plans to do some writing on diesel-engineering theory.


Before you buy any mixer check KWIK-MIX

16-S DANDIE® advantages

MOTO-BUG® . . . labor-saving power wheelbarrow takes all heavy manual work out of hauling, backing up, spotting, has full power forward and reverse . . . no push, no pull necessary. 10 cu. ft. hopper converts to 1200 lb. flatbed, fork lift, scraper blade.

✓ **ADJUSTABLE, DOUBLE-CONTACT SHAKER** on skip, with contact at each end of skip frame, has vertical shaking action. No twisting strain.

✓ **AUTOMATIC WATER SYSTEM,** accurate to fraction of a pint, combined with exclusive blade-and-bucket re-mixing action, produce consistent quality concrete every batch.

✓ **8-SECOND DISCHARGE** . . . tilted Flow-Line Discharge Chute, available only with Kwik-Mix, reaches deep into drum, discharges full batch in 2½ revolutions, saves seconds every batch.

✓ **INTERCHANGEABLE** side or end discharge . . . mixer can be changed from side to end discharge in less than an hour, because axles are easily interchangeable on square frame.

✓ **3-POINT SUSPENSION MOUNTING** on heavy coil springs (2 at each corner of rear, and 1 double-coil arrangement centered at front) absorb high-speed operating and travel shocks.

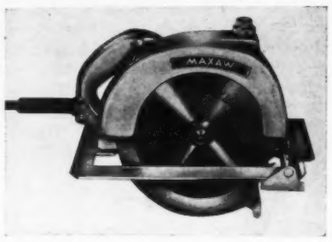
✓ **HEAVY CAST-STEEL DRUM HEADS** with machined roller paths . . . independent engine clutch . . . multiple V-belt drive . . . Tower Loader for overhead discharge . . . special 90" skip, are other 16-S features worth checking.

*Before you buy any mixer, get all the facts from your Kwik-Mix distributor on this big-production 16-S Dandie. Other sizes: 11-S, 6-S, 3½-S . . . also, bituminous, tilting and non-tilt plaster-mortar mixers, and Moto-Bug.*

To: KWIK-MIX Co., Port Washington, Wis. Send new catalog on 16-S Dandie, also:
NAME ☐ 11-S ☐ 6-S ☐ 3½-S
COMPANY ☐ 10 ☐ 14 ft. bituminous
STREET ☐ 6 ☐ 10 ft. plaster-mortar
CITY, STATE ☐ Tower Loader ☐ Moto-Bug
CEM

KOEHRING PRODUCT

KWIK-MIX
COMPANY • Port Washington, Wis.
(Koehring Subsidiary)



The Maxaw cuts 2⅝ inches on a square cut and 2 3/16 inches on a 45-degree cut. It weighs 14 pounds.

## An 8-Inch Power Saw

An 8-inch power saw has been announced by the Fred W. Wappat Division, Cummins-Chicago Corp., Mayville, N. Y. The Maxaw cuts 2⅝ inches on a square cut, and at 45 degrees it cuts through lumber 2 3/16 inches thick. It weighs 14 pounds.

The saw has a frame of die-cast aluminum alloy. The motor is a universal ac-dc 120-volt special with a no-load speed of 4,600 rpm. The saw is equipped with a double pole contact switch. The safety guard is of the telescopic type with quick return. Standard equipment includes one 8-inch combination blade, wrench, and rip fence guide. A steel carrying case is also available at extra cost.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 347.

## Booklet on Stud Welding

A booklet on the application of studs and other fasteners to steel surfaces is available from KSM Products, Inc., Merchantville 8, N. J. It explains that stud welding eliminates drilling, tapping, and hand welding, and shows the fundamental operating principles and typical applications of the process. It also contains information on KSM studs and stud-welding equipment. Drawings show the actual operating steps of the stud-welding gun. Both hand gun and production equipment are described in detail.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 339.

Brush cutting, timber sawing, and ground cultivation are applications of the Bachtold Bros. mower. It comes in self-propelled and push-type models.

## Brush Cutter and Saw

A Forrest, Ill., company, Bachtold Bros., Inc., makes a roadside development machine which can be used for brush cutting, timber sawing, or ground cultivation. Manufactured in a self-propelled and a push-type unit, the cutter carries a 20-inch saw blade which can be used in either horizontal or vertical positions. It can be ordered with a 3-hp Clinton engine and with mower blades, saw blades, a cultivator, or any combination. The unit will work on flat or hilly terrain and mows right up to wall abutments, guardrail fences, bushes, or trees. An adjustable runner controls the cutting depth.

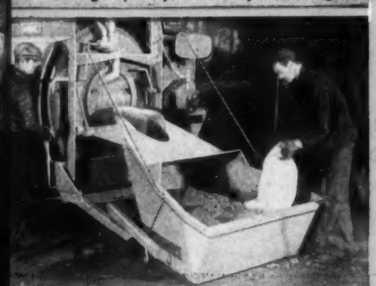
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 292.

## Hoist for Dump Trucks

A 4-page folder describing the Dube mechanical hoist for 1 to 2½-ton trucks is available from Detroit Mechanical Hoist Corp., 3502 W. Fort St., Detroit, Mich. It explains and pictures the construction and operation of this unit, and points out that the self-locking feature permits control by the driver at any dumping angle. The hoist is said to operate under all weather conditions —70 degrees below zero or 120 degrees above. The folder also gives brief data on the steel contractor-type dump bodies manufactured by the company.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 340.

½-S DANDIE with side or end discharge, tilt or non-tilt drum, is sturdy, light, portable for high quality, on-the-spot mixing.



2-WHEEL 11-S end-discharge, non-tilter, is also available on 4 wheels, side or end discharge for thorough Dandie-mixed concrete.

KWIK-MIX BITUMINOUS mixers . . . 10 and 14 cu. ft., are readily adaptable as stationary plants or as highly mobile 4-wheel units.

FOR DISCHARGE AT 9'-2" HEIGHT . . . Kwik-Mix Tower Loader fits 11-S and 16-S mixers . . . is also available for bituminous mixers. Loads into trucks, forms, overhead hoppers, or handles stockpiling. Collapses for travel.

**4-YD.-PER-MIN. Parsons 310 Trenchliner®**

With 45 digging feeds, this big-capacity 310 Trenchliner digs up to 4 cu. yards per minute, depending on depth, width of trench and type of material. It produces from 8" to 15½' of clean, smooth-walled trench per minute . . . digs 1½' to 4½' wide and 17' deep with single boom . . . and up to 6' wide at 11' depth with dual booms. 4 smaller models in Parsons line offers a wide choice of sizes to suit your exact requirements.

**PARSONS** (Koehring Subsidiary)
Newton, Iowa

**EASY-CHARGING Johnson Lo-Bin Batcher®**

Lo-Bin Trolley Batcher holds 8, 20 or 30 tons . . . is only 7½' to 9½' high for charging with front-end tractor loader. Lo-Bin has 2, 3 or 4 compartments, up to 4 weigh beams, 22 or 44 cu. ft. weigh hopper . . . or can be arranged for 2 or 3 aggregates and 1 bulk cement compartment. Efficiently serves 28-S, 16-S, 11-S, 6-S mixers. Lo-Bin is quickly dismantled, easily moved by dump truck. Optional: wheels, tires, tow-bar.

**C. S. JOHNSON** (Koehring Subsidiary)
Champaign, Illinois

**HIGH-DISCHARGE Koehring 16-E *twinbatch*®**

Here's a portable mix plant with controlled elevated discharge for all types of concrete construction. Boom on Koehring 16-E elevates 60°, swings in 160° arc. Bucket discharges controlled batch up to 21' (higher with special boom). 16-E produces up to 50 cu. yds. per hour, exceeding larger 27-E single-drum paver. Drives 6 m.p.h. on rubber tires job to job. Also check big Koehring 34-E *twinbatch* for major paving.

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## Book on Construction Equipment and Trucks

A practical and comprehensive textbook on automotive and construction equipment is on the market. It was written and published by Lieutenant Commander C. W. Lindgren, now on duty with the Bureau of Yards and Docks as Special Assistant for Field Activities with the Automotive and Equipment Division. Commander Lindgren—an engineer, a contractor, and an owner of automotive and construction equipment over a period of 30 years—has an excellent background of practical experience from which to draw. He has produced a valuable addition to the publications in the technical engineering and construction fields.

Simply written, "Automotive and Construction Equipment" takes a practical approach to the basic problems of the construction and transportation industries. Beginning with drivers and equipment operators, Commander Lindgren supplies an account of the duties and functions of the mechanic, the shop supervisor, the operations manager, and the dispatcher. He describes the operational features of gasoline and diesel engines, fuels, and lubricants, and reviews service instructions and maintenance procedures. In dealing with automotive equipment, the author gives his version of the soundest methods of truck and fleet operations, including both long and short hauls.

Economical and efficient practices are outlined for the use of hoisting machinery, tractors, graders, rollers, trenching machines, air compressors, and paving equipment. The function of each piece of equipment is explained, and text and illustrations show the link between rated capacities and actual units of work performed.

From his years of experience in supervising construction projects, Commander Lindgren gives some very useful data on hauling, grading, paving, gravel-pit operations, rock quarrying and crushing, trenching, tunneling, and deep-water construction.

Although the book was written primarily for the beginner, its 287 pages and 120 illustrations offer sound data to the practicing engineer and constructor. The man in the office is given the nod in sections on planning, cost estimates, and methods of arriving at reliable depreciation figures for equipment investments. The text is supplemented by eight appendices on such subjects as the weight and measure of freight commodities, repair estimates, truck formulas, tire capacities, and depreciation lists.

Priced at $4.50, copies of the book may be obtained by writing to the author, Lieutenant Commander C. W. Lindgren, Box 3620, Washington 7, D. C.

## Hydraulic-Dredge Catalog

A comprehensive booklet on hydraulic dredges and accessory equipment has been prepared by Morris Machine Works, Baldwinsville, N. Y. It outlines all features and applications of the Morris dredging plants and hydraulic dredge machinery.

The company offers a wide selection of dredge pumps, hulls, and accessory apparatus, designed to provide the right equipment for each installation. On-the-job photographs illustrate applications. The catalog points out that the Morris dredge may be obtained with plain suction or suction agitator, or with a revolving cutter on the suction head. It describes a traveling screen that may be installed over the suction intake. Plan and profile drawings illustrate the construction and the operating features of these units. The Morris dredges may be powered by electric motor, diesel engine, or steam power drive. Special pontoon hulls, sea-going hulls, or portable hulls may be obtained.

A number of heavy-duty dredging pumps are also presented in the literature. They cover a discharge capacity from 6 to 30 inches. The company points out that the Morris dredges have withdrawn material from more than 100 feet below the surface. They are built in lengths ranging from 30 to 100 feet. Dredged material can be delivered through a mile or more of pipeline depending upon the size, power, and design of the dredge. Additional data are given on suction equipment and fittings, discharge piping and fittings, revolving cutters, spuds, hoists, and service pumps.

This literature may be obtained from the company by requesting Bulletin 177, or by using the Request Card at page 16. Circle No. 363.

## Clamshell-Bucket Catalog

The line of excavating and rehandling buckets made by George Haiss Mfg. Co., Inc., Division of Pettibone Mulliken Corp., 141st to 144th St. on Park Ave., New York 51, N. Y., is reviewed in an 8-page folder. Each of the clamshells is illustrated and described.

Haiss makes three multiple-sheave buckets and three power-wheel rehandling buckets. Detailed data and sketches describe their construction features, and tables supply information on capacities, dimensions, and specifications. The excavating and trenching buckets are available in 11 different models with sizes ranging from ¼ to 2 cubic yards. Rehandling and light digging buckets are made in sizes to 3 cubic yards.

This literature may be obtained from the company by referring to Bulletin H-850, or by using the Request Card at page 16. Circle No. 259.

## Oklahoma Engineer Resigns

After four years as Chief Engineer of the Oklahoma State Highway Department, Stoner K. McLelland has resigned to engage in private enterprise. His successor is Gomer H. Bittle, formerly Assistant Chief Engineer. McLelland served 27 years as engineer for public agencies.


Grand Champ

Carroll Brown's big red TD-24 wins out on Colorado's "toughest road construction job ever!"

This summer, tourists welcomed the new wonder highway to the gleaming trout lakes atop Grand Mesa. But the men who built it called it "The Snake Pit"—a two-mile-high inferno of falling rocks, dynamite-proof basalt, and even prehistoric ice on the high north slopes where the sun never shines.

They had to clear out 300,000 cubic yards of snow before they could start building. They could work only from June to October each year—and they had to make a two-hour trip to the job each day because the air on Grand Mesa was so thin men couldn't stay at the job site.

It took five years and a million dollars to build six miles of highway—nearly a year and two hundred thousand dollars a mile. Carroll Brown, of the Brown Construction Company, finally finished the job with flying colors, and he came up with this conclus

"On this most difficult project our company ever tackled, u the severest conditions we ever encountered, the Internati TD-24 tractor definitely outperformed all competitive equipme

Once again the big red crawler had proved itself the Cha The Champ for tough, dogged, never-give-up guts—148 maxi horsepower at the drawbar, 8 speeds forward, 8 reverse, Pl Power Steering with finger-tip control.

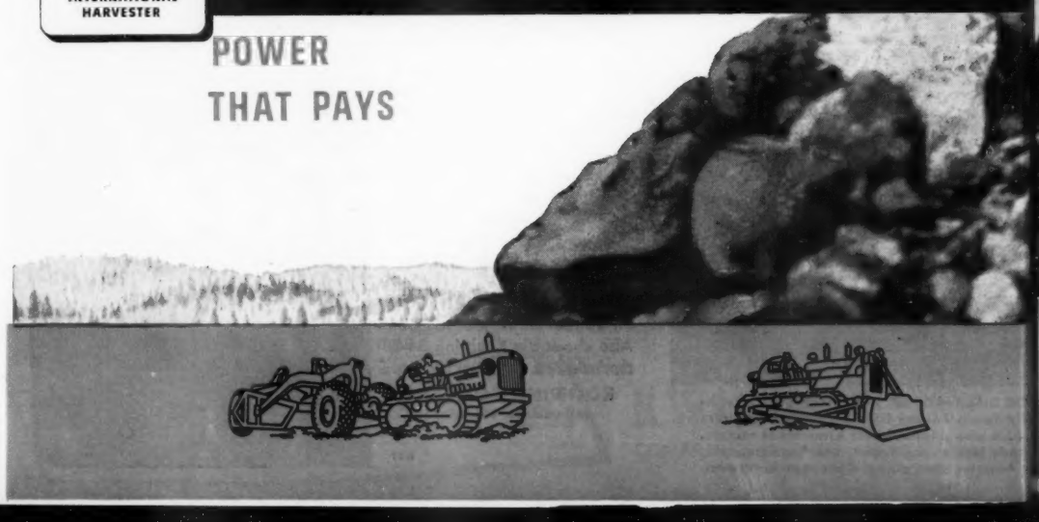
Ask your International Industrial Distributor for the real l down on the TD-24. It's backed by complete parts supplies and service facilities for the hard-working years ahead. Get the whole story. You'll be a TD-24 man from then on in!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

INTERNATIONAL HARVESTER

INTERNATIONAL

POWER THAT PAYS



## Wire-Rope-Splicing Tools

Descriptive literature and price lists covering a complete line of wire-rope-splicing tools are available from Quay Industries, 910 17th St., N. W., Washington 6, D. C. Featured are the Torque Master No. 1 and No. 9 splicing machines. The former has a capacity of 1/16 to 5/16 inch and the latter a capacity of 3/8 to 1 inch. The No. 9, however, has a jaw assembly which permits its use with rope diameters up to 1¼ inches.

The machines are designed to assure a safe, clean, uniform splice and at the same time to reduce labor. They can be used for splicing around thimbles, bushings, spacings, fittings, etc., and for loops. They permit splicing wire ropes with a right or left-hand twist (Langlay or regular-lay wire ropes). The machine has swivel jaws, a resistance regulator to overcome cable torque, and other features designed to permit one man to do the work of several.

Brief data and prices are also given for various wire-splicing tools such as marline spikes, wire tighteners, bronze hammers, plastic-tipped hammers, nippers, and wire cutters.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 366.

## Portable Aggregate Dryer

A 4-page bulletin available from Moorhead Machinery & Boiler Co., Tenth and Second Ave., S. E., Minneapolis 14, Minn., highlights the features of the company's portable aggregate dryer. It illustrates the unit, describes its applications, and lists specifications.

The dryer is designed for heating and drying materials preparatory to mixing on the job. The material is thrown or discharged into the hopper and thoroughly dried and heated in traversing the length of the trundle. Exit temperatures of 480 degrees F may be obtained, the company says. The rotary pump supplies fuel to the burner at constant pressure by means of a by-pass valve. The flame of the burner is adjusted by regulating the control valve. The dryer has a capacity of 5 to 10 tons per hour.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 315.

**TWO MILES HIGH** on Grand Mesa, an International TD-24 dozes more rock with more speed on new million-dollar highway. Volcanic rock, dense-grained basalt proved a pushover for the big red Champ.

## Preparing Surfaces For Best Protection

Protective coatings will develop their full capacity for corrosion resistance and long-term service only if applied to *clean* steel, concrete, and masonry surfaces. If they are applied to surfaces spotted with dust, dirt, loose mill scale, grease, unbonded paint, or other foreign material, their adhesive and protective properties are impaired.

Several methods are suitable for preparing surfaces to receive protective coatings, depending on the circumstances, the conditions, and the equipment available. Following are recommendations made by the engineering staff of Koppers Co., Inc., Tar Products Division, Pittsburgh, Pa., manufacturer of protective coatings.

On steel surfaces the contaminants are usually such substances as light rust, heavy rust scale, mill scale, welding scale, grease, oil, chemicals, old paint, dirt, dust. Protective coatings applied over them will bond to the contaminant, but not to the steel.

*Sand or grit blasting* is the best method of removing contaminants from metal surfaces. In cases of severe rusting, pitting, or heavy deposits of mill or welding scale, this is the only really effective method, since it removes all contaminants right down to clean metal. It usually provides a slightly roughened or "toothy" metallic surface—an ideal base for adhesion of the coatings. A sandblasted surface should be coated promptly to prevent rust formation.

*Flame-cleaning,* followed by wire-brushing, is often suitable for the removal of loose scale and light rust from metallic surfaces; it cannot be depended upon for the removal of deep rust. One of its advantages is that it leaves the cleaned surface temporarily free from moisture.

*Wire-brush cleaning* of all surfaces may be done with hand or power brushes; a power brush does a better job. When the brush cannot get down to the base of deep rust pits and remove corrosion deposits, the sand-blasing method should be adopted.

*Steam cleaning* with alkaline or acid solutions generally works well if the surface is greasy, oily, or grimy, and it is generally effective for stripping off old paint coatings. It is also used a great deal for the neutralization and cleaning of surfaces that have been soaked with acids or alkalies.

*Hand brushing with commercial solvents* and alkaline cleansing compounds is also effective for the removal of oils and greases.

*Acids on a surface may be neutralized* with a solution containing ½ to ¾ pound of washing soda per gallon of water. Dilute muriatic acid (seven to eight volumes of water) or vinegar (3 to 4 per cent acetic acid) may be used to neutralize alkalies. Neutralization must be followed by flushing with clean water or steam. Surfaces must be dry before the protective coatings are applied.

Concrete and masonry surfaces can be cleaned by some of the same methods suggested for cleaning metallic surfaces—that is, steam cleaning, wire-brushing, and chemical cleaners. The contaminants to be removed from such surfaces are usually dirt, loose sand, and laitance—sometimes oils and greases. To remove loose particles, the surface should be thoroughly brushed and blown with air, if possible. If necessary, stiff brushes should be used to insure thorough removal of loose materials. Acids and alkalies must be neutralized as with steel surfaces.

In some cases, concrete or masonry surfaces may be cracked or deteriorated to the point where chipping, patching, and other repairs are necessary to provide a smooth, uniform surface. Following these repairs, the surfaces must be brushed free of loose material.

# Modern and Low-Cost New England School

## Junior High Designed and Built for Future Expansion at South Portland, Maine; Ready for Fall Term

• OVERCROWDED conditions in the nation's schools are slowly being corrected in these years following the end of World War II by the construction of new, large, and improved quarters in all parts of the country. The buildings going up, or already erected, are modern, practical, and an immeasurable asset to their respective communities. They are also pleasing to the eye, and generally represent a worthwhile investment for the money expended.

A typical example of present-day school construction in smaller centers of population is the Junior High School now being built in South Portland, Maine—a city with a population of 21,732 (1950 census). South Portland lies across Fore River from Portland, Maine's largest city, and includes within its boundaries a sizable part of the facilities of that great North Atlantic port. The present high school is hard-pressed to take care of its heavy attendance—a condition which the new junior high, the first in South Portland, will help to relieve.

From the taxpayers' point of view, the 24-classroom building, obtained for little more than half a million dollars, is a real buy. It was designed for future expansion, and will ultimately supplant the existing older high-school building. The School Department, City Manager's Office, awarded a contract for the construction on the basis of a low $516,-932 bid. General contractor is Consolidated Constructors, Inc., of Portland, while the architect is Miller & Beal, Inc., also of Portland. The project got under way in September, 1950, and is scheduled to be completed in time for the opening of the fall term this coming September.

### Room for Expansion

A 28-acre plot was secured for the new school in the Mountain View Park section of South Portland. The building is V-shaped, with the corner at the intersection of the two wings chamfered off with a 30-foot diagonal where the main entrance is located. The wings, both set 100 feet back from the street they parallel, form an angle of 71 degrees 50 minutes at their intersection. The north wing, parallel with Evans Street, is 175 feet long, while the east wing, parallel with Highland Avenue, is 114 feet 3 inches in length. Both wings are 60 feet 4 inches wide. At the front of the building facing the streets there are two stories, but in the rear the school is three stories high as the ground slopes away to the north and east.

In addition to the concrete, brick, steel, and stone main building, the contract includes the construction of a 30 x 30-foot boiler house in the rear of the school. It will be fitted out with oil-burning boilers of sufficient capacity to provide steam heat not only for the present school, but for additions as well.

The basement of the junior high, at ground level in the rear, will house a cafeteria, shops, and storage rooms. Steel staircases at the center of the building and at the ends of both wings serve all floors. Corridors from the main entrance lead off to classrooms and offices on both wings of the first floor. The second floor contains classrooms and the library, a conference room, domestic-science rooms, and a large art room. Expansion plans for the future include the addition of a science laboratory, a gymnasium, and an auditorium seating 1,200 people.

C. & E. M. Photo

**A Rex transit mixer on a Sterling truck, owned by Cook & Co., Portland, Maine, discharges concrete for a wall pour at the South Portland Junior High School.**

### Foundations

One of the busiest subcontractors on the school is Ralph Romano, Jr., of Portland, who is handling the excavation, concrete, and brick masonry work. The necessary grading was done with a Bucyrus-Erie ¾-yard shovel, and a line of ⅞-inch sheeting was driven along the front of the building line to retain the earth bank in place. Gilbert Small & Co., Inc., structural engineer of Boston, Mass., designed the foundation for the structure.

The north wing in soft clay soil is

*(Continued on next page)*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**Vulcan Tool Manufacturing Co.**

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Republic Tips

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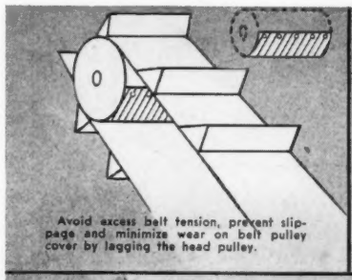
● With Republic Elevator Belting on the job, you're set to handle bigger pay loads with less trouble.

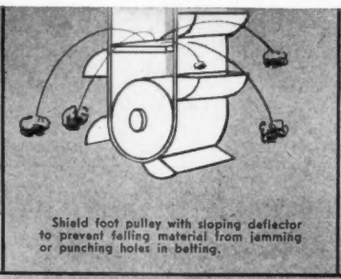
Don't lose this advantage by improper methods of application and maintenance!

Your local Republic Rubber Distributor can show you many ways to improve efficiency and increase service life of elevator belts. As an experienced specialist, he is fully prepared to help you select exactly the right Industrial Rubber Product for your requirement. Contact him today.

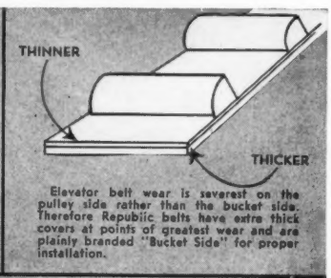
Remember, Republic Rubber has been *the* specialist in the field of Industrial Rubber Products for more than 50 years. Use Republic products and you use the best. Use Republic products *correctly* and you save the most!



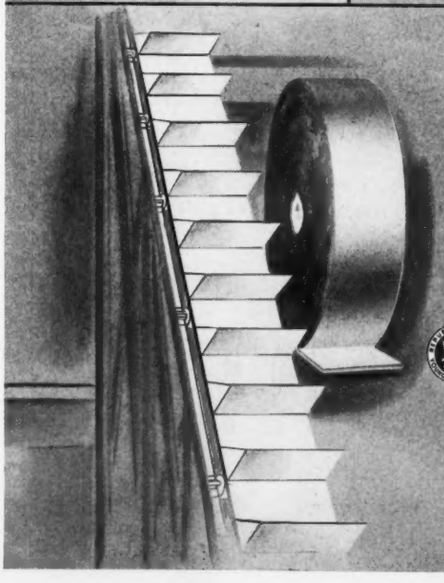
Avoid excess belt tension, prevent slippage and minimize wear on belt pulley cover by lagging the head pulley.



Shield foot pulley with sloping deflector to prevent falling material from jamming or punching holes in belting.




Elevator belt wear is severest on the pulley side rather than the bucket side. Therefore Republic belts have extra thick covers at points of greatest wear and are plainly branded "Bucket Side" for proper installation.



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Republic Elevator Belting is built to keep moving under the most grueling working conditions.

Made in fold-edge construction with multiple plies of heavy, prestretched rubber-insulated fabric, Republic Elevator Belting is specially designed to resist bolt pull at the buckets.

Tough abrasion-resistant black rubber covers give belt carcasses maximum protection . . . stand up longer under more severe service requirements.

Republic Elevator Belting is supplied in all standard widths and plies. All fabrics are permanently treated against mildew.

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INDUSTRIAL RUBBER PRODUCTS BY

**REPUBLIC RUBBER DIVISION**

Lee Rubber & Tire Corporation

YOUNGSTOWN, OHIO

supported mostly on piles, while the east wing, located on a firmer sand-gravel stratum, has a foundation of spread footings. Altogether there are 93 cast-in-place concrete piles up to 24 feet in length. Pile shells are 12¾-inch OD, with a thickness of 3/16 inch, and were supplied by Bancroft & Martin Rolling Mills of South Portland, which also supplied the reinforcing steel to the project. The piles were driven to a 40-ton bearing in a stratum of hardpan by subcontractor E. J. Asselyn of Portland, using a Vulcan No. 1 air hammer working off a pair of compressors.

Spread footings for the interior columns in the east wing are 5 feet 10 inches square x 1 foot 6 inches deep. Over the piles are concrete caps—5 feet 3 inches x 2 feet 6 inches and 3 feet deep—that serve as footings. The piles are embedded 6 inches in the footings. Along the front of the building is a concrete footer 2 feet 6 inches wide x 1 foot 6 inches deep that supports the reinforced-concrete foundation wall. This wall is 16 inches thick, and is 12 feet high from its foundation to first-floor level.

### Transit-Mix Concrete

The basement floor is a concrete slab 5 inches thick laid on a blanket course of gravel. The spread and pile-cap footings support 1-foot 5-inch square concrete columns that reach up only to first-floor level. Above that are structural-steel columns and framework. The first-floor slab is 5½ inches thick along the side fronting the street so as to stiffen the building against any lateral thrust. The front wall is backfilled up to the level of street grade. The first-floor slab along the rear side of the building is only 2½ inches thick, supported on bar joists. It is reinforced with welded-wire steel mesh.

Formwork for the front foundation wall consisted of ¾-inch sheathing backed with 2 x 4 studs on 16-inch centers, and double 2 x 4 wales on 27-inch centers held in place with Richmond ties. Form lumber on the job was cut with a Speedmatic 75 portable electric saw. Concrete for the job was supplied and delivered to the site in transit trucks by Cook & Co. of Portland; the material came from the company's batch plant in suburban Scarboro, a 3-mile haul from the job. The 3,000-pound-strength mix contained 5½ bags of cement to the cubic yard, and was delivered in Rex 4-yard transit mixers mounted on Sterling trucks.

In pouring the caps and footings, the mixers usually chuted the concrete directly into the forms. On the wall pours they backed up a ramp and discharged the concrete into wheelbarrows which were pushed over a timber work platform to the forms. The concrete was vibrated as it was placed. Foundation walls were waterproofed with two coats of Aquella No. 2.

### Superstructure

Above the concrete foundation walls facing the street is a 34-inch-high course of English white bed stone making a decorative background for the lawns in front of the building. The same material is used for all pilasters and around the main entrance. It is a very hard limestone, warm white in color, which does not darken with age. It was furnished by Emerson-Norris Co. of Boston, which claims that the material has been previously used only on the United Nations buildings.

*C. & E. M. Photo*

**Workmen on South Portland's Junior High cut form lumber with a Speedmatic 75 portable electric saw.**

The structural-steel framework, supplied by Maguire & Jones Co. and erected by Robbins & White Co. of Portland, is fairly light, with the columns mostly 8 x 8-inch 31-pound H-sections. Bethlehem Steel open-web joists are spaced on 24-inch centers over the entire second floor and a portion of the first floor. The roof is a Kaylo decking of reinforced precast planks, 36 inches long x 18 inches wide x 2⅝ inches thick. The planks are fastened to the purlins, and their joints sealed with grout. The roofing material weighs 4 pounds to the square foot.

In the ceiling of the library there are nine Plexiglas circular domes to afford the utmost in natural light for readers. The ¼-inch-thick shells are 41½ inches in diameter. Corridor and room ceilings are either Owens-Corning Fiberglas acoustical tile or acoustical plaster. Floors are either asphalt or rubber tile, except for some areas on the ground floor which are covered with Mastipave. The latter, supplied in rolls, is a heavy black asphalt felt with an asphalt mastic wearing surface.

At the ends of the building the walls are red brick, 12 inches thick and backed with plaster. The long sides of the school are mostly windows, steel sash trimmed with aluminum, with spandrels

*(Concluded on next page)*

4-wheel drive 1½-yd. Model HM PAYLOADER on New Jersey Turnpike, George M. Brewster & Son, Inc., contractor.

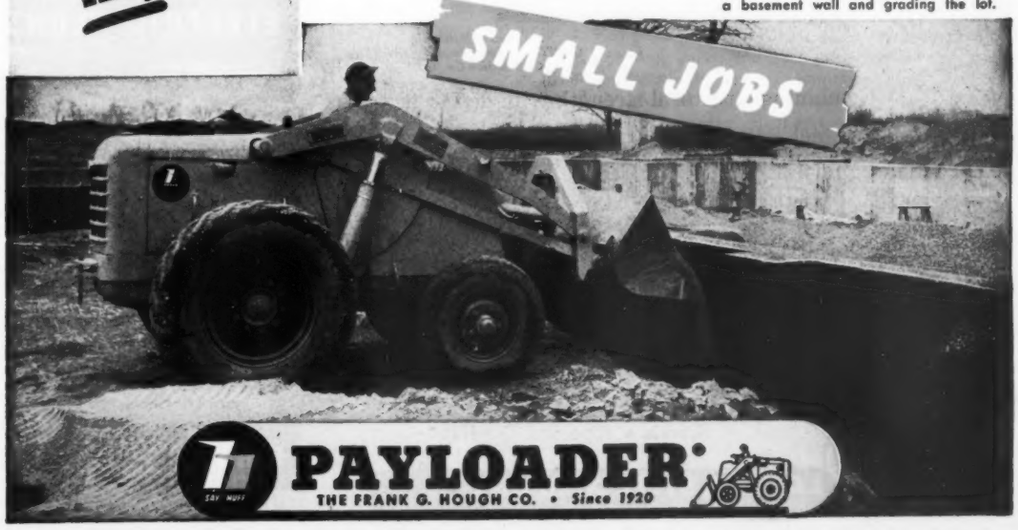
PAYLOADERS Pay Off on Any Job

Big or small — tough or easy — any job is a Payloader job . . . because only a PAYLOADER is completely designed for its purpose.

Only the PAYLOADER gives you the high multiple forward and reverse speeds . . . the engine over wheels for maximum traction . . . the powerful shovel crowding action . . . the simplicity of design for maintenance economy . . . the tip-back bucket to assure full loads . . . the dependability of large heavy duty clutches . . . the rugged overall construction and complete operator comfort and visibility which means more working hours per shift.

That's why many of America's progressive contractors, large and small, own fleets of PAYLOADERS; why Public Bodies rely on PAYLOADERS; why you too should investigate these high speed, rugged tractor-shovels. There's a size of PAYLOADER to fit your job; 12 cu. ft.; ½-yd.; ¾-yd.; 1¼-yd.; 1½-yd. See your Hough Distributor or write The Frank G. Hough Co., 762 Sunnyside Avenue, Libertyville, Illinois.

½-yd. Model HE PAYLOADER backfilling a basement wall and grading the lot.

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## Modern and Low-Cost New England School

*(Continued from preceding page)*

of alberene stone between the windows. The stone is backed with brick and plaster.

### Personnel

An average force of from 100 to 125 men has been employed on the construction of the South Portland Junior High School by the contractor and subcontractors. The general contractor, Consolidated Constructors, Inc., is represented on the project by Adolph Sullivan, Superintendent. Lester I. Beale of Miller & Beale, Inc., architect, is personally supervising the construction. Charles Emery, Clerk of the Works for the city of South Portland, inspects the work of the contractors.

## Sweeper Attachment

A sweeper for Ford tractors has been announced by Meili-Blumberg Corp., New Holstein, Wis. The broom is driven by the rear power takeoff at a fixed ratio to engine speed. This provides controlled sweeping at all tractor travel speeds, the company says. The unit sweeps a 5-foot swath at a 30-degree angle and deposits debris outside of the tractor wheels. Both fiber and steel brushes are available.

**The Meili-Blumberg sweeper for Ford tractors sweeps a 5-foot swath at a 30-degree angle and deposits debris outside of the tractor wheels.**

The manufacturer reports that the broom may be attached or removed within a half hour. Some of its features are heavy-duty shafts, ball bearings, finger-tip power-hydraulic control for raising the boom, and a full-length dust hood to protect the operator. The manufacturer also points out that the broom tilts to adjust itself to the surface and that all moving parts are fully protected for added safety.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 331.

## Simple Wood Protection

A simple method of preserving and protecting wood is outlined in a 15-page brochure available from Osmose Wood Preserving Co. of America, Inc., 1437 Bailey Ave., Buffalo 12, N. Y. It points out that the use of Osmosalts enables treatment of any wood by unskilled labor and without expensive plants or equipment.

Drawings show how the wood preservative may be applied by dip, brush, or spray methods. Photographs illustrate its uses in the construction field, and by state and county highway departments. The company recommends the product for protecting timber used for guardrails, piles, bridges, tunnel ties and posts, and places where the wood is exposed to attacks of fungi, termites, and other wood-destroying insects.

The literature points out that the Osmose wood-preserving compound may be used to treat any species of wood and can be applied wherever green fresh-cut wood is available. Osmosalts are carried deep into the green wood through the sap vehicle. The preservative salts are then attached firmly to the wood fibers and remain fixed internally after the wood has seasoned. Cross-section photographs of various types of timber illustrate the penetrating properties of Osmosalts.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 313.

## Case for Heavy-Duty Trucks

A 24-page easy-to-read book, "The Case for Heavy-Duty Trucks", has been issued by The Autocar Co., Ardmore, Pa. While it cites arguments for heavy-duty Autocars specifically, many of the persuasive points—economy, dependability, speed, and long life—apply to heavy-duty trucks in general.

It discusses ten essential features claimed for heavy-duty trucks (26,000-pound gross vehicle weight and over): (1) they haul big loads; (2) they control the loads; (3) they are strong all over; (4) they are dependable; (5) they are economical; (6) they make man-hours highly productive; (7) they keep pace with the speed of traffic; (8) they are virtually custom-built; (9) they have extra power when needed; (10) they are long-lived. In the last two pages, a case for the Autocar Driver Cab is made in text and pictures.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 329.


**Year-around All-Weather Patching Now Possible with McCONNAUGHAY**

HOT (UP TO 300°F) OR COLD

"MULTI-PUG" ASPHALT MIXER

The Patching Mixer for Summer or Winter

The best way to keep repair costs down is to repair the breaks when they first appear.

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*Beauty* **plus STRENGTH with LACLEDE STEEL JOISTS**

*Architect: Albert Anis*
*Gen'l Contractor: Edw. M. Fleming Construction Co., Inc.*

Combining structural strength with design flexibility, Laclede steel joists played an important role in the construction of this modern new Biscayne Terrace Hotel in Miami, Florida.

Careful control of quality from open hearth to finished product in the modern Laclede mills is your assurance of dependable quality when you specify these Laclede construction steels:

Steel Joists • Welded Wire Fabric • Corrugated Centering • Multi-Rib Round Reinforcing Bars • Accessories

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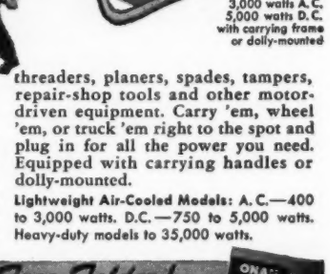
*Cut Costs!* with ONAN portable ELECTRIC PLANTS



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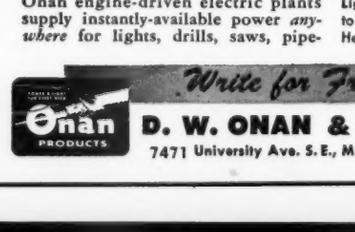

*Take 'em Anywhere!*

Increase your profits by using fast-working, cost-cutting electric tools on every job, even where highline power is not available. Lightweight, sturdy, Onan engine-driven electric plants supply instantly-available power *anywhere* for lights, drills, saws, pipe-threaders, planers, spades, tampers, repair-shop tools and other motor-driven equipment. Carry 'em, wheel 'em, or truck 'em right to the spot and plug in for all the power you need. Equipped with carrying handles or dolly-mounted.

Lightweight Air-Cooled Models: A.C.—400 to 3,000 watts. D.C.—750 to 5,000 watts. Heavy-duty models to 35,000 watts.

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7471 University Ave. S.E., Minneapolis, Minnesota

With a new connector now on the market, Brik-Toters can be used in pairs to raise material two levels.

## Conveyor Connector Doubles Lift Height

A new connector assembly for joining two standard Brik-Toter conveyors has been developed by Mar-Rail Conveyor Co., 560 York Ave., Pawtucket, R. I. It enables a contractor to use his Brik-Toters separately for raising materials one level, or together for raising materials two levels. The company reports that no sag or deflection results when the Brik-Toters are bolted together. The two units become a rigid single truss 40 feet long.

The maximum lift depends to a certain extent on the nature of the material being raised. Any of the usual masonry materials can be raised at least 20 feet from the ground, the company says. The connector assembly is sold separately and is furnished with the necessary bolts. Nuts are prewelded in all Brik-Toters.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 372.

## New Copying Machine

A new copying machine is announced by Charles Bruning Co., Inc., 100 Reade St., New York 13, N. Y. Reports prepared in the field on ordinary paper can be reproduced quickly and easily with this machine, as can letters, charts, diagrams, etc.

The BW Copyflex uses the diazo process and does the entire copying process within itself. It needs no inks, tray development, dark rooms, or special lighting. It has no annoying fumes, Bruning says, and does not require "make ready", plumbing, or exhaust ducts. No stencil, negative, or special operator training is required.

The machine copies any size of original matter up to 11½ inches wide x any length. The cost of an 8¼ x 11-inch copy is said to average under 2 cents, including labor, materials, machine depreciation, and all other charges.

The BW Copyflex needs no installation; it is just connected to the office electric line—110 volt, 60 cycle ac. It is 29½ inches wide, 28 inches deep, and 50 inches high.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 276.

## Block and Sheave Catalog

A 24-page catalog describing the complete line of American blocks and sheaves in sizes from 1½-ton snatch blocks to 500-ton multisheave special blocks, has been put out by American Hoist & Derrick Co., 63 S. Robert St., St. Paul, Minn.

It gives the block number, the capacity in tons, the number of sheaves, the rope size, and the weight of each block. The illustrations, ratio table, and formulas in the catalog help make reeving and line-part figuring easy for riggers. Detailed and easy-to-understand specifications simplify ordering. All related items are grouped to avoid unnecessary hunting.

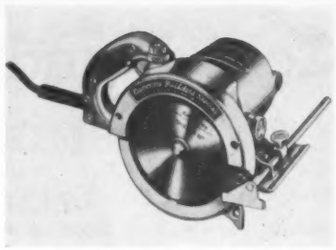
This literature may be obtained from the company by requesting Catalog No. 300-24, or by using the Request Card at page 16. Circle No. 274.

## Two Electric Saws

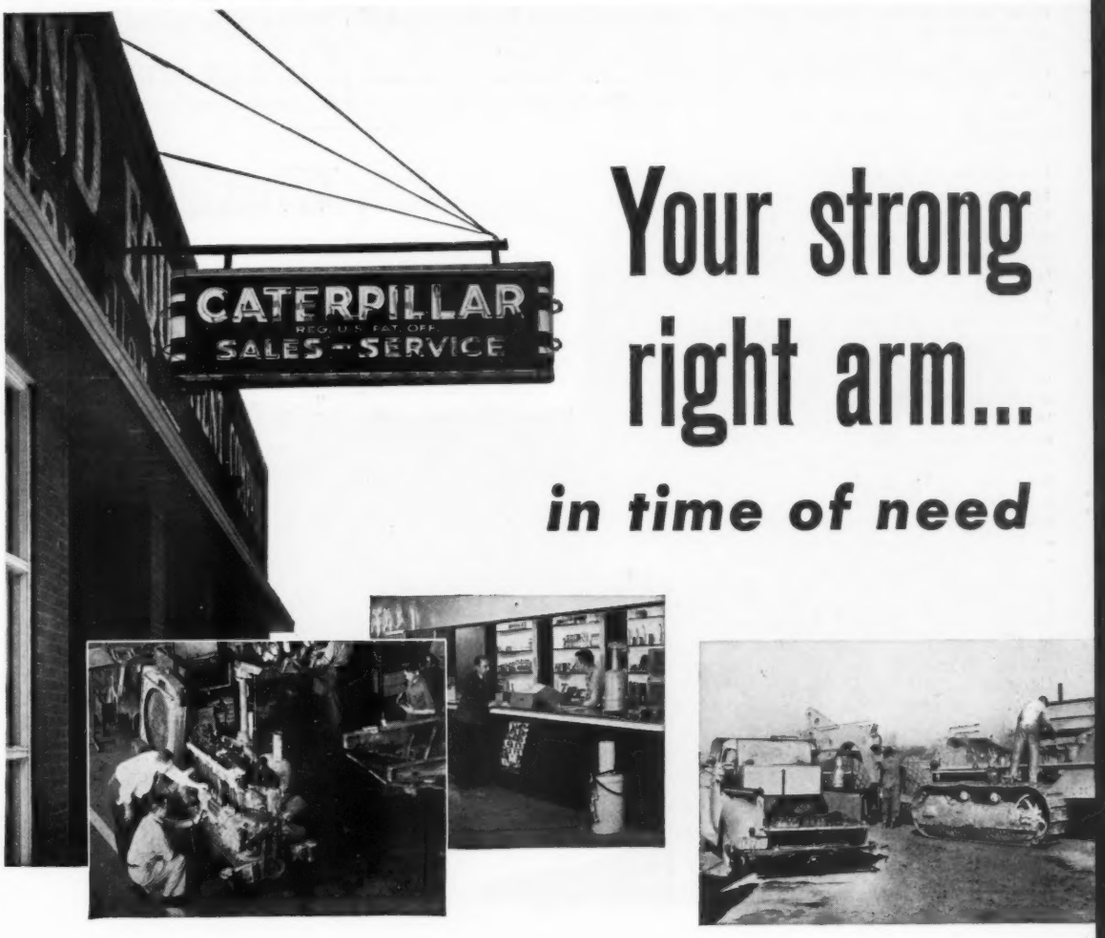
Two new electric saws have been placed on the market by Cummins Portable Tools, Division of Cummins-Chicago Corp., 4740 N. Ravenswood Ave., Chicago 40, Ill. The Model 700 power saw weighs 10 pounds and has a 6⅜-inch blade that cuts 2 1/16 inches deep. Base adjustments are 3/16 to 2 1/16 inches at 90 degrees, and up to 1 ⅞ inches at 45 degrees. No-load speed is 5,500 rpm. The Model 800 for heavier jobs weighs 14 pounds. With an 8-inch blade, it cuts 2 ⅝ inches on a square cut, and saws through 2 3/16 inch lumber at 45 degrees. Its base adjustments are 1 inch to 2 ⅝ inches at 90 degrees, and up to 2 3/16 inches at 45 degrees. No-load speed is 4,600 rpm.

Both saws have die-cast aluminum frames; universal ac-dc motors for 115-volt lines (220-volt special); ball bearings on the armature shafts; ball and roller bearings on the saw shafts; hardened-steel armature pinions and bronze alloy on the shafts; double pole switches with lock buttons; telescopic-type safety guards; and 12-foot 3-conductor cords with 2-prong plugs and pigtail connectors for ground.

Further information may be secured from the company. Or use the Request Card that is bound in at page 16. Circle No. 373.



Cummins has brought out two new Builders Special electric saws, Models 700 and 800 with 6⅜ and 8-inch blades respectively. This is Model 700.


# Your strong right arm...

## *in time of need*

BECAUSE of the vast defense mobilization program, material shortages and extra production demands have gripped the nation. They affect particularly the heavy industries and the distributors and users of their products. And huge as America's facilities have become in recent years, they still are not large enough to keep pace with both military and civilian needs.

Nevertheless, as an owner of "Caterpillar" products, you are among the more fortunate. Your "Cat" equipment has been built for long life and to withstand severe working conditions. What's more, it is backed by a dealer organization that is world-famous for experience, accessibility, mechanical facilities and field service to keep you going "come hell or high water."

Since World War II, the already large number of "Caterpillar" sales-and-service establishments has increased greatly. Also since that time, "Caterpillar" and its dealers have developed new techniques for restoring and extending the life of "Caterpillar" products. Today, in their own shops, "Caterpillar" dealers can *rebuild* a great many worn or damaged parts which formerly required completely new replacement. In short, every dealer is richly acquainted with scores of modern ways and means for keeping your machines in good working condition. You can help by doing this:

***Take your maintenance problems to your "Caterpillar" dealer BEFORE parts are worn beyond repair***

Remember that excessively worn parts can cause damage to mating parts; that track parts, pistons and liners, crankshafts, cylinder heads, radiators and other items usually can be salvaged. Your problems are your dealer's problems. Go see him today. He'll do everything in his power to keep your machines operating. Your combined efforts will be reflected in longer equipment life.

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DIESEL ENGINES
TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

*C. & E. M. Photo*

**These piles are for a pier of the Troy Street Viaduct. Only those at the rear have been poured and reinforced with steel. The hole will be unwatered and the piles blown out before they are filled with concrete.**

## Cobi Mandrel Drives Cast-in-Place Piles

*(Continued from preceding page)*

used to inflate the mandrel. At first nitrogen was chiefly employed because of its dryness and lack of condensation, but equally satisfactory results have been obtained with filtered air. A small Westinghouse 40-cfm compressor, mounted on the rig, furnished the necessary air at a pressure of 125 pounds per square inch. The controls on the Lima were also actuated by air pressure from the compressor.

Driving was done with a Vulcan No. 1 single-acting hammer, delivering 15,000 foot-pounds. The deflated mandrel was attached to the hammer and raised to the top of the leads where it was inserted into the Hel-Cor pile shell. It was then inflated, forming a single unit of mandrel and shell for driving. When the pile shell was driven to the required depth or penetration, the mandrel was deflated and withdrawn, leaving the shell open for internal inspection. The watertight shells were practically dry with no depth of water, and any rain water that collected was blown out before they were filled with concrete.

### Extensions

At the lower end of the single-length shells, a boot or pan was welded or brazed to the shell where it entered the ground. When piles longer than 60 feet were required, a 12-inch Armco spiral-welded steel pipe, at least 20 feet long, was driven first. Then the thin-gage shell was welded to the top of the heavier pipe with a special connection. The connection consisted of a casting, welded to the shell, and then slipped over the end of the pipe pile. The joint was sealed with a bituminous roofing cement. In driving, the boot of the mandrel contacted the shoulder of the casting. Only the driving head of the No. 1 hammer was used with the pipe-pile initial extension lengths; the Cobi Pneumatic mandrel was inserted after the shell was attached.

Piles were driven through first a few feet of cinder and gravel fill, then a layer of peat, and next through strata of silt and sand until hard, coarse gravel was reached. In all the test piles that were driven and loaded to 80 tons, there was less than ¼ inch net settlement.

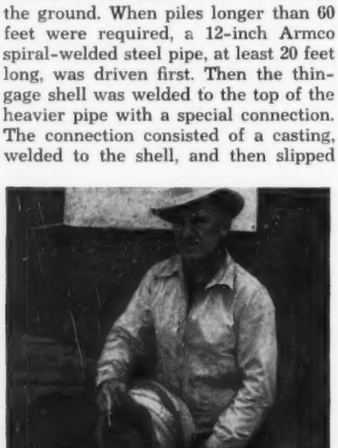
Working on timber mats the big driving rig drove piles that are battered both in from the top and out from the top as well as plumb. The shell piles actually screw into the ground, making a complete revolution for each 40-foot length that is driven. Some of the longest piles on the project were driven under contract 2 for one of the piers at the Troy Street Viaduct. There the maximum length was 120 feet of composite pile—60 feet of Hel-Cor shell following 60 feet of Armco spiral-welded steel pipe pile.

### Filled With Concrete

The general contractor furnished transit-mix concrete for filling the shell piles. They were strengthened with spiral steel reinforcing at the top where the driving was easiest through the softer strata. All concrete was placed in the dry.

The design of the structures varied considerably because of the extremely limited area in which the Expressway is being constructed. Typical bents contain from five to seven columns of reinforced concrete on footings supported on piles. Pile lengths range from 15 to 120 feet, and where battered the average slope is 4 on 12.

No great speed was expected in closely confined working quarters through an urban area where buildings had first to be demolished before work could start. However the contracts proceeded on time, and were completed on schedule. C. L. Guild personally supervised the work of his 8-man pile-driving crew; Palmer Lake was Pile-driving Foreman, and Roy Vaughn was Field Engineer.



*C. & E. M. Photo*

**Roy Vaughn, Field Engineer for Guild Construction Co., holds a casting which will be welded to the end of an Armco shell pipe when it is driven with a pipe pile.**

LIFELINES

THROUGH
LOW-COST AGGREGATE

THE vast networks of American railroads and highways are the arteries of the nation, carrying the output of factories, farms, mines and forests, providing the lifeblood for national security and progress.

America on wheels rolls on aggregate . . . hundreds of millions of tons of aggregate that must be produced at *the lowest possible cost per ton* for UNLIMITED CONSTRUCTION of the high speed roadways so urgently needed.

Cedarapids equipment provides American contractors with the means to keep aggregate production costs at lowest levels . . . consistent big volume output, long-life construction, low operating and maintenance costs, and high quality finished products that meet exacting specifications.

Cedarapids equipment brings OPPORTUNITY UNLIMITED to *you* with bidding advantages you can depend on to beat competition. For complete plants or single units . . . for producing either aggregate or black top . . . see your Cedarapids distributor for details.

Cedarapids
Built by IOWA
*headquarters for*
QUALITY EQUIPMENT

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.

## Some Tips for Safe Materials Handling

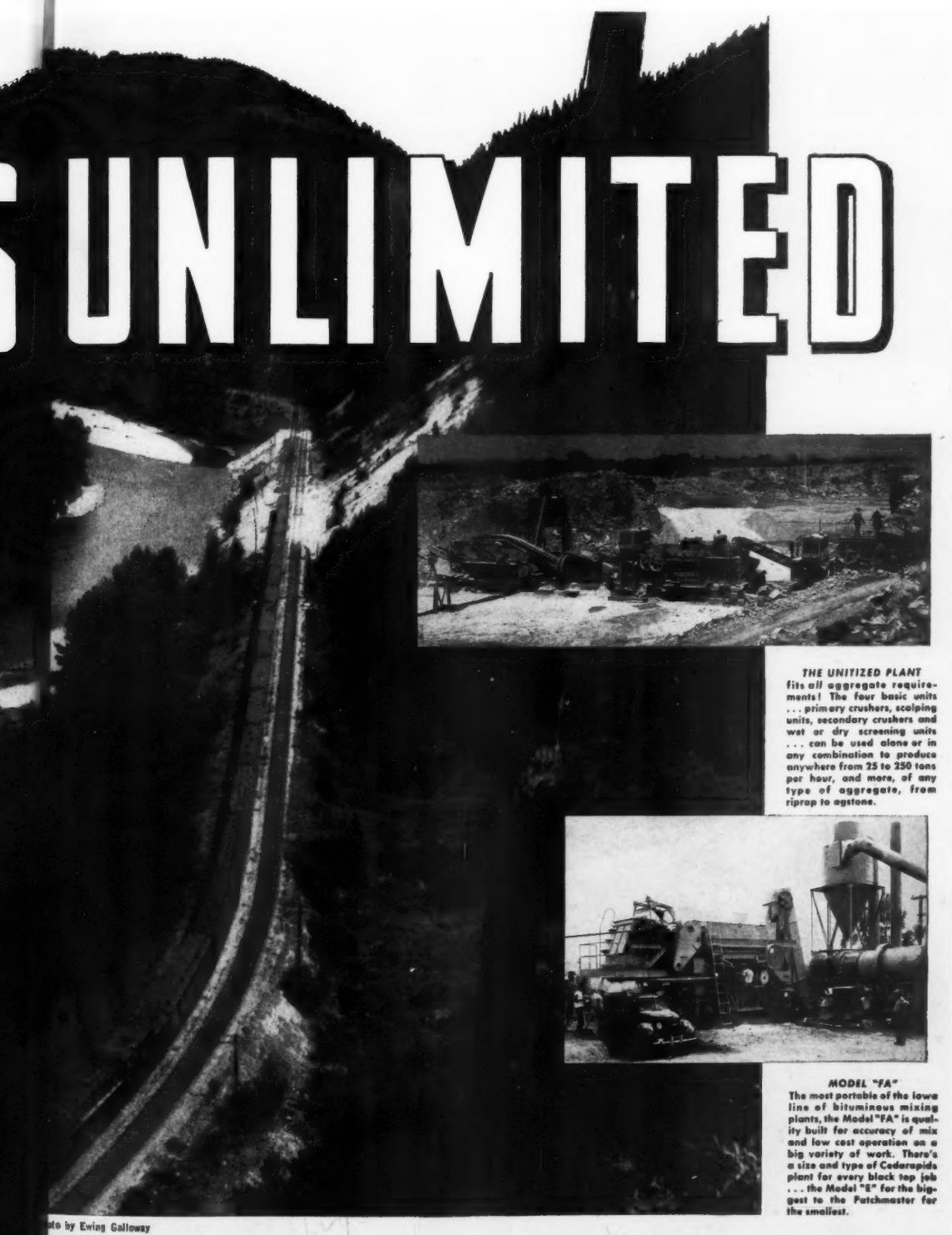
The supervisor's activity in preventing injuries to workmen handling materials is an important one. His area of preventive activity includes injury to the workman himself, to other employees, and to equipment and property. Only by constant use of the three well publicized E's of safety—Engineering, Education, and Enforcement—can he hope to decrease accidents. This advice and a few tips on safe materials handling were given by William S. Visokay, Superintendent of Safety, Bridgeport Brass Co., at the 21st Annual Convention and Exposition of the Greater New York Safety Council.

In selecting materials-handling machines, the men who will operate them must be borne in mind. Mr. Visokay recommends that minimum standards be set up to govern the selection of personnel for handling jobs, the specifications to vary according to the type of equipment being used. All equipment should be purchased with the necessary safety devices installed. If this is not possible, the devices should be installed before the equipment is put in use. As examples Mr. Visokay cited the use of a rear-view mirror on fork trucks and an attached fire extinguisher for all gasoline-powered equipment.

In addition to safety goggles, shoes, and gloves, it is important that men wear foul-weather gear when working out-of-doors. Mr. Visokay also suggested that safety rules be printed and distributed to the men, and that specific regulations covering the use of flags, signs, and signals be established and enforced. Clear working areas, good repair of equipment, adequate lighting, overload prevention, and safety meetings are important, he said.

### Atlas Powder V. P.

R. K. Gottshall was elected a vice president of the Atlas Powder Co., Wilmington, Del., at a recent meeting of the board of directors. He joined the company in 1927; became Director of Explosives Sales in 1943; and Assistant General Manager of the Explosive Department in 1948. His most recent assignment was as Assistant to the President.

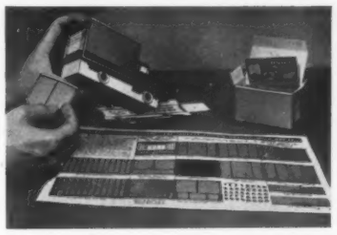




THE UNITIZED PLANT fits all aggregate requirements! The four basic units . . . primary crushers, scalping units, secondary crushers and wet or dry screening units . . . can be used alone or in any combination to produce anywhere from 25 to 250 tons per hour, and more, of any type of aggregate, from riprap to agstone.

MODEL "FA" The most portable of the Iowa line of bituminous mixing plants, the Model "FA" is quality built for accuracy of mix and low cost operation on a big variety of work. There's a size and type of Cedarapids plant for every black top job . . . the Model "E" for the biggest to the Patchmaster for the smallest.

Photo by Ewing Galloway

THE IOWA LINE *of Material Handling Equipment Includes:* ROCK AND GRAVEL CRUSHERS • ELT CONVEYORS • STEEL BINS • VIBRATOR AND REVOLVING SCREENS • UNITIZED ROCK AND GRAVEL PLANTS FEEDERS • PORTABLE POWER CONVEYORS • PORTABLE AND STATIONARY STONE, GRAVEL AND SAND PLANTS • EDUCTION CRUSHERS • BATCH TYPE AND VOLUMETRIC TYPE ASPHALT PLANTS • DRIERS • DUST COLLECTORS AMMERMILLS • WASHING PLANTS • VIBRATING SOIL COMPACTION UNITS • DOUBLE IMPELLER IMPACT BREAKERS

You can design and order the truck body you need with Fruehauf's cardboard-model kit. It offers 500 options you can exercise in selecting production-line bodies.

## Model Kit Selects Proper Truck Body

A model kit that enables you to design and order a truck body suited to your needs, and still get a mass-production job, is offered by Fruehauf Trailer Co., 10928 Harper Ave., Detroit 32, Mich.

There are over 500 options which the buyer can exercise to make the body meet his particular requirements. The kit enables the prospective purchaser to assemble his own model in carboard for the purpose of studying the advantages of each set of options he is considering. When the model is assembled it provides a replica of the body desired, and thereby simplifies ordering and purchase.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 344.

## Grinders for Mowers

A bed-knife grinder for hand and power-operated mowers is made by George E. Hazard Co., Rochester, N. Y. It is said to save up to 90 per cent of grinding time because the blade need not be removed from the mower during grinding operations. A single setting is used in grinding both bed-knife and reel blades, allowing the blades to meet in exact alignment.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 358.

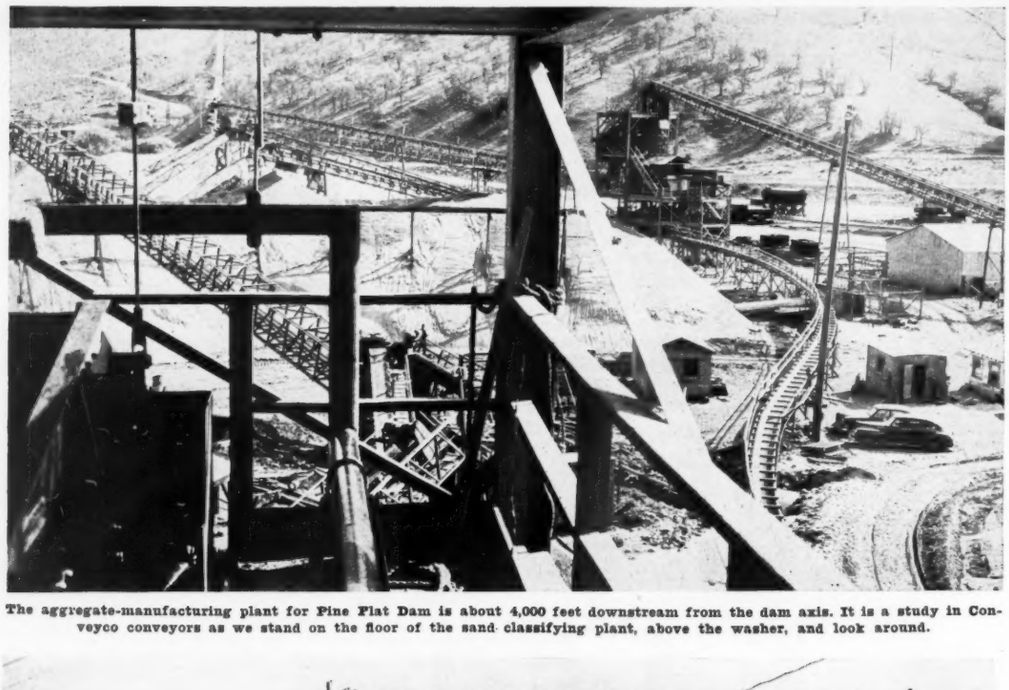
## New Life-Saving Vest

A Life-Save vest for bridge workers, dock workers, ship builders, and other marine-construction workmen has been announced by Industrial Products Co., 2855 N. Fourth St., Philadelphia 33, Pa. Outside covering is a strong closely woven drill cloth. Filling is a high-quality kapok. More buoyant than cork, 16 ounces of kapok will support a heavy man in water, the company claims.

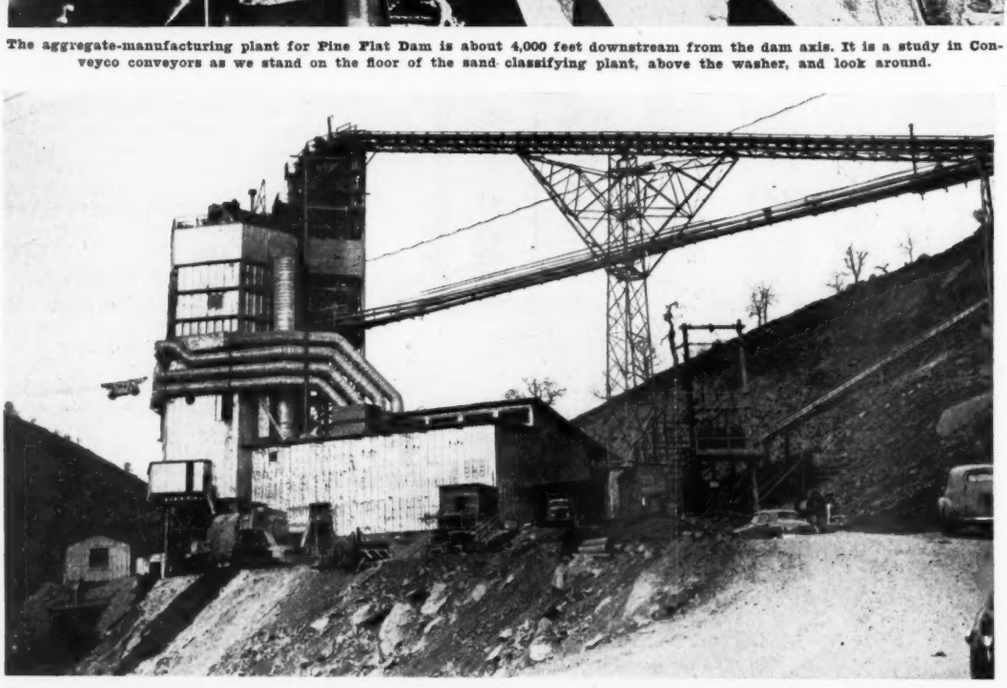
The vest is designed to permit freedom of the arms and is ventilated for year-round use. A double-bend flexible-waist construction assures fit and comfort when bending over or sitting down, the company says. The vest is orange-colored as an added safety feature.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 327.

The outside of this Life-Save vest for marine-construction workmen is orange drill cloth; the inside is kapok.



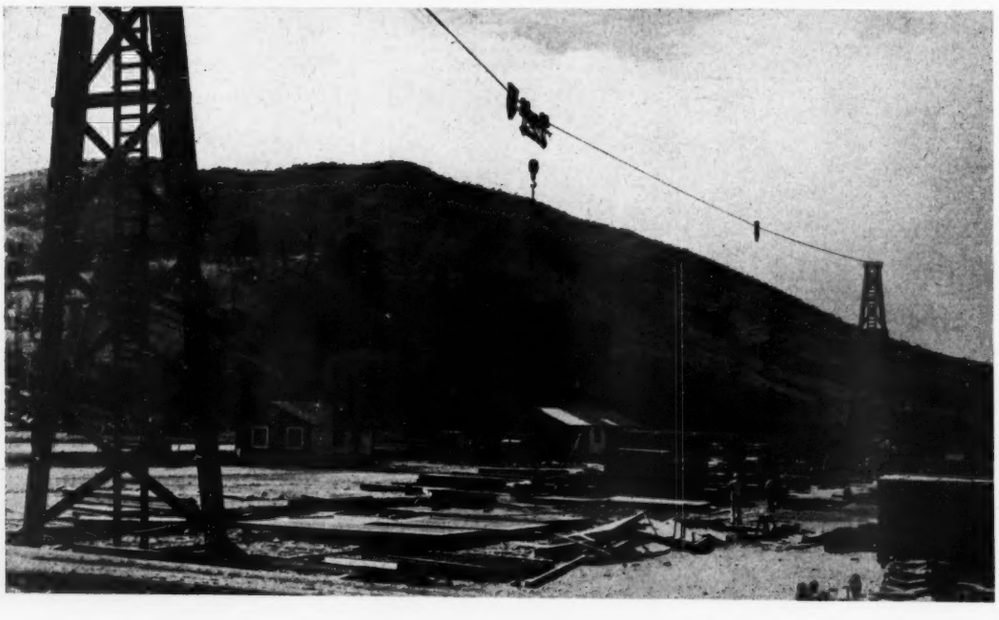
The aggregate-manufacturing plant for Pine Flat Dam is about 4,000 feet downstream from the dam axis. It is a study in Conveyco conveyors as we stand on the floor of the sand classifying plant, above the washer, and look around.



High on the left abutment we take in the Noble 1,750-ton batching plant. The big cold-air ducts from the cooling plant to the batching bins make the whole setup look like something out of Buck Rogers.

*C. & E. M. Photos*

Near the aggregate plant is the central carpenter yard of Pine Flat Contractors. Notice the 275-foot cableway system in the yard. It helps a lot to speed fabrication of the heavy-duty wooden cantilever forms used on the dam.



# Concrete Cooled Fo

## All-Natural Aggregates Are Produced, Then Cooled by Cold Air Plus Tube Ice to Give 50-Degree Concrete

By RAYMOND P. DAY,
Western Editor

• FIFTY-DEGREE concrete, some of the most consistent yet produced at that temperature, is being placed in the starting blocks of Pine Flat Dam near Fresno, Calif. Ranking among the 8 highest concrete dams in the nation, Pine Flat's massive block of concrete will be 440 feet high and 1,820 feet long at the crest when construction comes to a close in 1953. The entire concrete mass is being placed at maximum temperatures under 50 degrees.

All-natural aggregates, from a river deposit downstream from the dam, are being cooled by a unique combination of cold air and tube ice to meet Corps of Engineers specifications. Although up to 25 per cent is permitted under the specifications, no rock crushing is contemplated. With 100,000 cubic yards of a 2,150,000-yard concrete total already placed, most of the "bugs" have been located and remedied. The contractors are now fully confident that the 100-plus summer temperatures will pose no foreseeable cooling problems that the plant equipment cannot solve.

Pine Flat Dam, conceived primarily for flood control, will stand across Kings River about 30 miles northeast of Fresno, near Piedra. Pine Flat Contractors, a joint-venture firm, holds the $24,339,776 Corps of Engineers contract for its construction. The sponsoring firm for the five-contractor group is Guy F. Atkinson Co. of South San Francisco. Other firms participating are Bressi & Bevanda Constructors, Inc.; Chas. L. Harney, Inc.; J. A. Jones Construction Co.; and A. Teichert & Sons, Inc.

### Dam Badly Needed

The uncontrolled flood flows of Kings River represent the last obstacle to the full agricultural and industrial development of the area now served by this unruly mountain stream. The heavy seasonal runoff usually rushes down the Sierra Nevada slopes and pours into a shallow river channel and canal network on the valley floor. The water comes to rest in the fertile Tulare Lake Basin, and frequently pours over into the San Joaquin River through Fresno Slough. Since 1936 over $15,000,000 in estimated flood damage has occurred.

As if to vindicate the judgment of engineers who designed and conceived the massive barrier, Kings River chose the most vulnerable possible moment to loose its greatest flood: 116,000 cfs. It waited until bedrock was all exposed and the first low concrete blocks were

*(Continued on next page)*

# For Pine Flat Dam, Calif.

in. In less than an hour it leaped up and overtopped the earth and timber cofferdams. All the forms then set were washed away. The entire concrete area was covered with about 10 feet of sand and muck. Railroad tracks down in the aggregate-production area below the dam were warped and twisted. A $200,000 concrete bridge, which the Corps of Engineers had built under a previous contract, lay broken and ruined when the flood was over.

Thus the river demonstrated dramatically that it needed some firm measure of control.

At the Pine Flat site, the entire 1,000,000 acre-feet of reservoir storage is needed for flood control. However, climatic conditions also will let the engineers hold the pool for conservation storage at the end of the flood season. As a result, the reservoir can be operated for irrigation, development of hydroelectric power, and other benefits that accrue from stretching a heavy seasonal water supply over a long, dry summer. With foothill storage added to an already developed distribution system, water users can draw their established share when they need it, instead of leaving the time of delivery to the river.

### Gravity-Type Design

Pine Flat is a straight gravity-type design. The 50-foot monoliths are designed without special joint attention, except that a copper water stop is placed upstream from the dam axis between each of the joints. This seals off any water that might seep down between the blocks. The largest monolith is about 340 feet wide at the base.

The 1,820-foot crest length is divided into three increments. The right-abutment nonoverflow section is 789 feet long. The spillway section is 292 feet across. The left-abutment nonoverflow section is 739 feet across.

Six radial gates, 42 x 38 feet, will permit the spillway crest to be varied. In addition, there are to be two sets of five 5 x 9-foot conduits, and three 13½-foot power penstocks are also being installed.

So far as elevations go, the lowest point of bedrock is at elevation 540. The lower set of sluice inlets is at 570. The outlet end of the power penstocks is at 590; the upper inlet end at 655. Then come the upper sluice inlets at 740, and the top of roadway at 970.

The reservoir will be 19 miles long, with a 67-mile shore line, and will cover a maximum area of 6,300 acres. At that stage the reservoir will hold its maximum: 1,100,000 acre-feet.

### Natural Aggregates Selected

Designers of Pine Flat Dam chose natural aggregates from the river bottom to make the concrete. Generally speaking, the aggregate deposits washed down by Mother Nature over the centuries are fairly well graded and sized for modern concrete. Fifty-degree-maximum temperature control, coupled with a low cement ratio of 2.5 sacks per cubic yard in the inner concrete, will enhance thermal dissipation and reduce shrinkage cracks when the massive block of concrete cools, according to the engineers.

The production site for raw aggregate is about 7 miles downstream from the dam. Pine Flat Contractors sublet a

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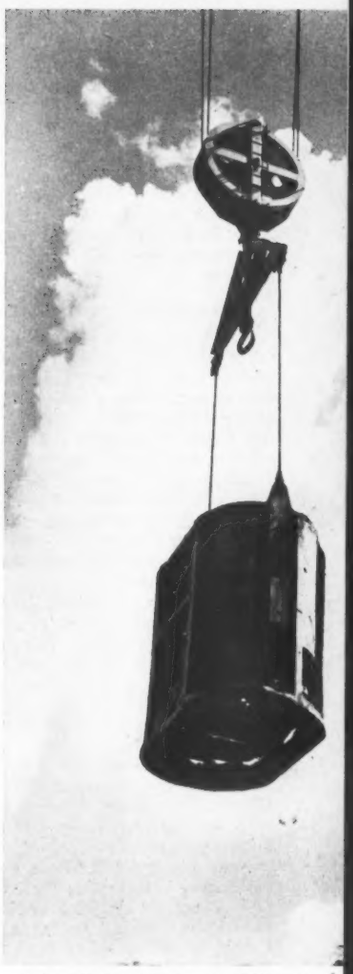

**Silhouetted against the California sky, an 8-yard Gar-Bro bucket drops from the cableway into position over one of the early monoliths (see below) to rise on Kings River. Some 2,150,000 yards of concrete will be in Pine Flat Dam when it is completed in 1953.**

## Concrete Is Cooled For Pine Flat Dam

*(Continued from preceding page)*

railroad construction job to Sharp & Fellows of Los Angeles for the standard-gage railroad track from the supply point up to the dam. From the supply point to the town of Piedra, this railroad was laid alongside the existing Santa Fe spur line. Beyond that point a new roadbed had to be constructed to the dam.

### Raw-Aggregate Production

The raw-aggregate pit is about 1½ miles long, with an area of approximately 200 acres. Strip loading in 60-foot swaths is being practiced, with a Bucyrus-Erie 120-B backing up the full length of a swath and loading to six Western 30-yard railroad cars. The 120-B swings a 6-yard Esco bucket from a 70-foot boom, and has no difficulty reaching out to cover a 60-foot radius. There are two 44-ton General Electric locomotives, and they pull three cars per train.

The function of the initial classifying plant is to reject all rocks over 6 inches in size, to remove debris like roots and logs, and to classify the raw material into two sizes: sand and rock. Into the latter classification goes everything from ¼-inch to 6 inches.

As the trainloads of raw material come in from the 120-B dragline, the side-dump cars roll their loads into a 170-yard receiving hopper, covered with 18-inch-space grizzly rails. The large stones and debris are at once removed at this point. There is a concrete tunnel under this receiver, with three Conveyco eccentric feeders which shovel the material out to a 48-inch Conveyco belt 200 feet from head to tail sheave. Driven by a 150-hp electric motor, this conveyor run carries the raw material up to the top of the classifying plant.

At the top of this plant, the material drops to two F-600 Ty-Rock vibrating screens, 5 x 12 feet, driven by 15-hp motors. The oversize on the 6-inch mesh drops immediately down to several waiting 20-yard Western dump trucks, which carry it off to a waste area. Plant officials estimate that roughly 25 per cent of material has to be wasted in this manner.

Throughs on the 6-inch screen, which are retained on the 3-inch mesh, pass directly to a large surge pile nearby. Throughs from the 3-inch pass to three sets of Symons shaker screens driven by 15-hp motors. Everything from 3-inch to ¼-inch is separated here, to pass out over Conveyco conveyors to the surge pile. Throughs from the No. 4 screen, of course, are destined to become the sand for the concrete mix. At the present time, this material is screened dry; however three Wemco sand washers are being installed between the Symons screens and the sand storage pile to increase the output of the primary plant.

The entire conveyor system of this as well as subsequent sizing plants was engineered and manufactured by Conveyor Co. of Los Angeles.

It was planned that enough raw aggregate could be stored in the surge piles to carry concrete operations for four days if some part of the plant should break down. The two surge piles are tapped by feeders and 48-inch belt conveyors, which raise the material to a loading point over the railroad track which leads to the dam. One Baldwin and one American 100-ton locomotive each pull 8 Magor 30-yard cars per train. The train contents are seldom mixed, since it is desirable to have entire trainloads of material arrive at the main classifying plant either as sand or rock.

Some of the worst flood damage in the November and December storms was suffered by the initial sizing plant. Practically all the railroad tracks were twisted and broken, pits were flooded, and the plant alone was left standing as floodwaters swirled around its base. A service bridge washed out and had to be replaced. But within a month, the plant was again humming at capacity.

### Aggregate-Manufacturing Plant

The aggregate-manufacturing plant is located in a large, flat area about 4,000 feet downstream from the dam axis. Its function is to separate the material into definite finished sizes suitable for the manufacture of concrete. However, because of breakage farther on, some additional sizing is required in a rescreen tower before the material enters the batch plant.

As the trains come in to the aggregate-manufacturing plant, the cars are side-dumped into a huge 250-ton hopper, which will take a whole trainload of material. Two Conveyco 36-inch x 8-foot feeders, gear-driven by 5-hp motors, put the material on a 168-foot conveyor run 36 inches wide. A General Electric 100-hp motor furnishes power for this belt to bring the material up to the first division point, which is known as Transfer Structure No. 6.

The transfer station is designed to take either sand or rock and switch it to the proper part of the plant's classifying system. Let's take sand first, for example. When a trainload of sand comes in, the Conveyco transfer device shunts it to a 36-inch conveyor 138 feet long, radial-mounted on the discharge end to cover 35 degrees—or a much wider area than would be possible if the discharge end were stationary. Radial stacking with this line permits a live raw storage of about 8,000 tons.

Sand is then drawn out from under this storage pile by a 24-inch conveyor 450 feet long, which carries it to the washing and classifier plant. When the sand is running about average, approximately 70 per cent is routed over two Allis-Chalmers 4 x 12-foot low-head screens, and from there to a Dorr classifier. About 30 per cent goes to two Dorr sizers, which make up any deficiencies in the classifier discharge. However, the split of sand can be varied

*(Continued on next page)*


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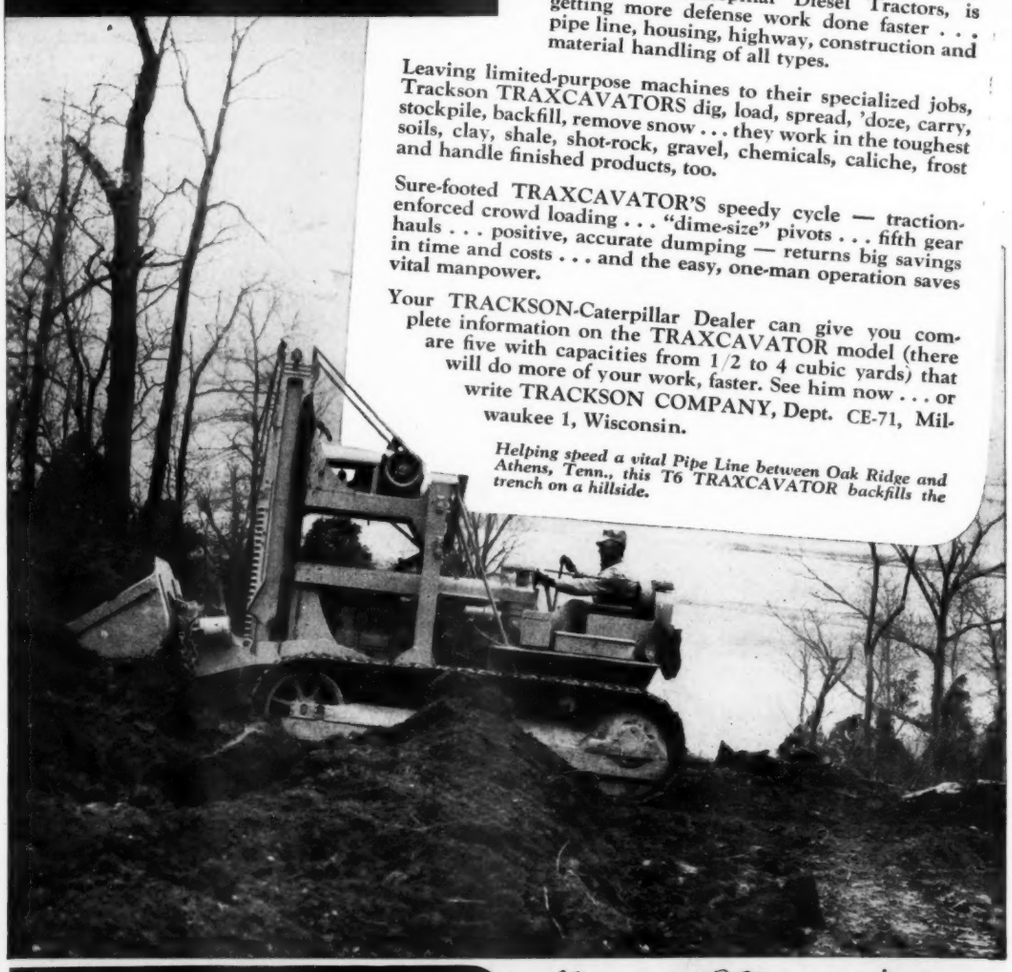
Your TRACKSON-Caterpillar Dealer can give you complete information on the TRAXCAVATOR model (there are five with capacities from 1/2 to 4 cubic yards) that will do more of your work, faster. See him now . . . or write TRACKSON COMPANY, Dept. CE-71, Milwaukee 1, Wisconsin.

*Helping speed a vital Pipe Line between Oak Ridge and Athens, Tenn., this T6 TRAXCAVATOR backfills the trench on a hillside.*



**TRACKSON**
TRACTOR EQUIPMENT

in many ways, and with one combination if the sand is running right to meet the specifications, it can be shunted directly to the storage pile. The sand is divided for blending purposes and drainage into a number of piles. There is a pile of No. 4 to No. 8 and No. 16 to No. 30 which can be used for blending. There is a pile of No. 50 material and one of No. 100.

A radial feeder conveyor stacks material for intermediate storage, for drainage, or for future blending. Sand is generally drained about 72 hours to let its moisture content equalize at a low point. From the intermediate pile the sand passes—with blending if necessary—to a finished live-storage pile of 6,000 tons. This pile is over a reclaiming tunnel where a 36-inch conveyor 4,000 feet long is located. It sends the sand on up the mountain to the batch plant.

So far as rock sizing is concerned, it, too, passes through a complicated but efficient process. When rock arrives at the Conveyco transfer station, it is routed immediately to a 4,300-ton live-storage gravel surge pile, containing everything from No. 4 to 6-inch material. A 36-inch Conveyco feeder 5 feet long then moves the material to a 36-inch conveyor run 265 feet long, which moves the rock to a scrubber and screening plant.

The scrubber and screening station contains two 5 x 14-foot sets of Allis-Chalmers Ripl-Flo screens, and two sets of Allis-Chalmers 4 x 12-foot low-head screens, along with a 7 x 24-foot trommel scrubber made by Willamette Iron & Steel Co. of Portland, Oreg., an Atkinson subsidiary.

The first screen of this system contains 6 and 3-inch mesh, so all material retained by this wet screen passes directly to the 6-inch cobble stockpile. Throughs from the 3-inch size pass down through the scrubber, where all dirt and colloidal material is removed. Then this material is sized by the other screen decks to minus 3 plus 1½-inch; minus 1½ plus ¾-inch; and minus ¾ plus No. 4 gradations.

Live-storage capacities of the various piles are 3,000 tons for 6-inch; 2,500 tons for the two next smaller sizes; and 1,500 tons for ¾ to No. 4 material.

From the scrubber and screening plant, muddy waste water is carried down a flume to a sump, where three Wemco sand pumps are located. They lift the waste water about 30 feet to another gravity flume, which carries the material away from the area to a stilling basin near Kings River.

A 5-hp gear-driven 36-inch x 8-foot pan feeder then taps the 6 to 3-inch live-storage pile to place this material on the 4,000-foot delivery conveyor. Each of the other sizes is fed to the same belt by 30-inch x 5-foot belt feeders. Ironically, perhaps—after all the effort to size the material accurately—the rock aggregates are recombined on the delivery conveyor as it carries this material up to the rescreen tower above the batch plant. Sand, of course, is sent up separately in as exact a gradation as skill can produce. And considering that a fineness-modulus fluctuation of only 0.10 from the previous monthly average is permitted, that's getting it mighty accurate. Sand samples are run almost continually to hold the proper blending of sizes to constant level.

Enormous quantities of water are required by this sizing and screening operation. Three large 1,750-gpm Layne & Bowler pumps with 100-hp motors pump from a sump adjacent to the river. The sand plant alone takes about 3,000 gpm, while the scrubber-screening plant takes 2,000 gpm more.

### Aggregate Rescreening

Due to the practical difficulty of conveying material 4,000 feet from the screening plant to the top of the hill on the left abutment where the batch plant is located, coupled with the breakage of rock sizes at several transfer points, a rescreening station over the batch plant is necessary. This rescreening station simulates generally the process which separated the sizes initially down below at the screening plant.

When the 36-inch inclined belt conveyor reaches the rescreening station, it discharges material to a 2-way selector chute. No attempt is made, when handling sand, to separate or resize it. The selector chute has a hinged receptacle which is opened when sand is handled, and the material flows by chute directly to the sand compartment of the batch plant.

When coarse aggregate is being handled, this hinged gate is closed. There is a level plate in the selector chute which causes a pile of No. 4 to 6-inch material to build up under the discharging material. This not only reduces the breakage of rock, but it also cuts wear in the steel chutes. The material then rolls naturally off two sides of this pile, where it goes down to two Allis-Chalmers 5 x 16-foot double-deck Ripl-Flo vibrating screens set at an angle of 20 degrees.

Sizing of the 6 to 3-inch cobbles is a very easy matter, because the top screen deck simply scalps this material off and drops it to a 24-inch belt conveyor. It is conveyed to a rock ladder which trains it as gently as possible to the bin compartment of the batch plant designed for this size of material.

Meanwhile, all 3-inch-minus material falls to the second deck of the Ripl-Flo screen, which in turn scalps off at the 1½-inch break point; 1½ to 3-inch aggregate passes by exactly the same method as the previous size to its place in the batch bins.

Somewhat finer control is required on the two smaller sizes. Minus-1½-inch material passing through the lower Ripl-Flo deck goes to the feed box on an Allis-Chalmers double-deck 4 x 14-foot low-head horizontal vibrating screen. The ¾ to 1½-inch material passes from the discharge end of the first deck over a belt conveyor to another bin compartment in the batch plant.

That leaves only minus-¾-inch material. Due to some breakage, and whatever dust has developed on the journey up the mountain, there is some fine material to be removed from this "pea gravel". A No. 4 screen mesh on the lower deck of the last screen retains the

*(Continued on next page)*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## Concrete Is Cooled For Pine Flat Dam

*(Continued from preceding page)*

acceptable pea gravel and places it on its storage conveyor to the batch plant. Objectionable fines are washed off the gravel as it passes through the rescreen tower and carried away by gravity through a pipe and flume to a dump in the canyon below the batch plant.

One of the features of the rescreen tower is that the screens are supported on a separate structure, independent of the batch plant. This takes all vibration from batching and mixing operations.

The rescreen tower gets its water from the main line of a Layne & Bowler 2-unit pumping station at the foot of the mountain. Pumps in this station take Kings River water and send it to the batch plant, where part is used for washing the aggregates, part for mixing water, and part in the cooling and ice-manufacturing process.

### Noble Batching Plant

Basically, the concrete plant consists of a full-automatic Model CA-1750 Noble batcher, complete in detail, with a total storage capacity of 1,750 tons of aggregate and cement.

The plant is the last word in modern concrete proportioning, and represents everything all batch-plant manufacturers have worked long and diligently to achieve. The plant has a 1,400-barrel cement compartment and 5 aggregate compartments. It has a head frame and swivel distributor for aggregates. It has separate supports for four Smith 112-S 4-yard concrete mixers, and for the gob hoppers into which the tilting mixers discharge.

The Noble batching system also includes many controls which make the Pine Flat Dam concrete batching a reasonably exact science. For example, there are individual scales for each aggregate, and for cement, ice, and water. Controls are centralized at one stand. Every concrete batch goes on permanent record by means of an automatic printing device which records the weight of each material that entered the batch.

Handling of larger-size aggregates with speed and precision has always been difficult, but this plant with its Noble "dribble type" automatic slide gates for each aggregate has solved that problem. There is an automatic dispenser for the air-entraining agents which put about 5 per cent of air in the mix and make it easier to handle. The plant has a surge tank for the water scale, a dry-batch collecting cone, and a distributor from batcher to mixer chutes. For the recalibration of the scales there is a complete set of test weights, which aid in holding the concrete proportions constant.

The gob hoppers are mounted on the mixer supports independent of batching or weighing supports. They are equipped with a pneumatic ram-operated dump gate, permitting the concrete-transfer car to pick up a load from below in the shortest possible time.

The four Smith mixers are 4-yard Model 461's, and they too are the latest word in every detail. Tilting action of these mixers is air-controlled. They are equipped for front-end charging and discharging, with a charging chute. Tilting can be done either manually or with a solenoid-operated tilting valve, and tilting has an air lock. Each mixer has a 75-hp Louis Allis motor for power, with a full-voltage starter. The mixers have power-input discharge-lock consistency meters, and electric batchmeters.

The insides of the Smith mixers are designed for a mixing area of one square foot for every 6 pounds of material. The liners and front face blades are hard-coated for long wear. Electrically-applied cast-iron rod has proved to be an excellent hard-facing metal.

### A Huge Cooling Plant

The cooling plant, designed by Hightower Heat Engineering Co., combines the use of cold-air aggregate cooling with tube ice to lower the concrete temperatures below 50 degrees. There is also provision made to cool the cement by passing it through an ice-water-jacketed feed box, driven by a cold screw . . . made so by means of internally circulated ice water.

The cooling plant uses two Vilter ammonia compressors, each driven by 200-hp Ideal electric motors, to develop the necessary refrigeration capacity for cold-air cooling. Four Ingersoll-Rand Type ES-1A ammonia compressors, each driven by 150-hp motors, furnish refrigeration to three Vogt tube-ice machines, each rated at 65 tons every 24 hours. Added to that is ice-cold

*(Continued on next page)*


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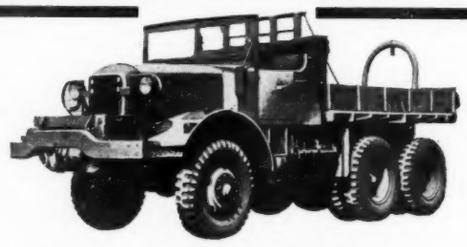

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water from the cooling tank which is always available. The cold water, fed to the ice machines, shortens the freezing cycle. Used as mixing water, it helps to lower temperatures. And when this chilled water is used to cool the air—which is its prime purpose—it is helping to cool the aggregates.

When the coarse aggregates leave the rescreen tower and enter the batching-plant bins, a blast of 35-degree air immediately starts to circulate continuously through the rock. Driven by four huge fans, the frigid air enters the bins through a false grizzly-bar bottom, and passes upward through the materials. Regardless of the season of the year, it is highly desirable to reclaim this air, because it usually is much colder than ambient outside temperatures even after it passes through the aggregates. The top of the batching plant is therefore roofed specially to form a common plenum chamber in which the air, after passing through the aggregate, is returned to the cooling apparatus.

The ducts from the cooling apparatus to the bins are all heavily insulated and covered with aluminum foil. There is a 42-inch duct to the 6-inch cobble bin, and 36-inch lines to the other three bins. Viewed from the outside, the batching and cooling-plant setup looks like something supercharged from Buck Rogers, because the big cold-air ducts stand out prominently against the massive structure of the batch plant.

Air is chilled by passing it upward toward the aggregate bins through three banks of cold-water sprays. The water for these sprays, maintained at 34 degrees, is cooled by refrigerant tubes in a large cooling vat. Air passes up through these sprays at a velocity of about 500 feet per minute.

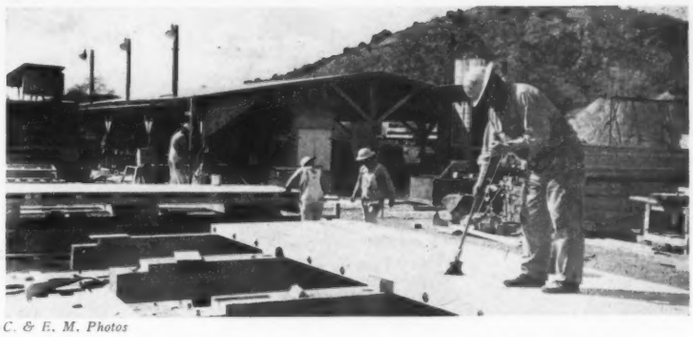
Efficient as the plant is, every natural device is also being used to hold the aggregate temperatures as low as possible before they enter the plant. In general, wet-bulb temperatures permit the aggregate and sand to be cooled even in hot weather to 75 degrees, approximately, when they are delivered to the batch plant. Even the conveyor system leading up the mountainside is covered with a bright aluminum housing, to protect the rock and sand from the sun.

Sprinkling cools the stockpiled aggregates. This is carried on just far enough so that evaporation of this water, by a process of adiabatic saturation, maintains the materials at approximately 5 degrees F above prevailing wet-bulb temperatures.

### An Improved Cableway

Mixed concrete from the Noble batching-mixing plant is hauled a short distance over a railroad, and dumped to waiting Gar-Bro 8-yard divided concrete buckets at a loading dock. These buckets are carried on one of the most modern, improved cableway systems yet designed for massive dam construction. One of the two 25-ton cableways at Pine Flat can travel and hoist at the same time.

The ultra-fast hoist on the concrete cableway was designed and manufactured to company specifications by Willamette Iron & Steel Co. It is about 60 per cent faster than the conventional 25-ton Lidgerwood hoist on the second cableway, which is used primarily for miscellaneous yarding and small concrete pours.



*C. & E. M. Photos*

**In the carpenter yard for the Pine Flat project one workman (left) smooths up a fir facing with a Holt sanding machine, while another (above) oils new forms.**

The cableway has been so situated that most of the dam concrete can be lowered, instead of having to be raised. The cableway consists of two separate units with 60-foot head towers and 45-foot tail towers. Stretching between these towers is 2,419.4 feet of 3½-inch locked-coil main cable, with a uniform weight of 30 pounds per linear foot. There is an approximate 5½ per cent deflection across the span. Operating cables and slack carriers, along with takeup cables, are uniform-weight 10-pound-per-foot cables.

Both towers have about 340 available feet of travel. An operator in a central control booth high in the batch plant controls the cableway equipment according to telephone or bell signals from below, and there is always an emergency operator on duty in the

*(Concluded on next page)*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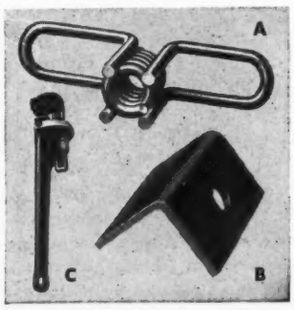


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## Concrete Is Cooled For Pine Flat Dam

*(Continued from preceding page)*

head-tower control room.

### Placing, Joints, Curing

Concrete is being placed at Pine Flat Dam in 5-foot lifts in monoliths 50 feet wide, extending the full thickness of the dam at any given point. The forms are filled progressively from one side to the other by stepping down in two or three lifts, and carrying the whole placing operation closed up within about 40 feet. This eliminates the possibility of cold jointing, especially in hot weather.

The buckets from the cableway are spotted by telephone signals, and an air-operated mechanism dumps the bucket gates. Garlinghouse has built into each bucket a positive, efficient dumping characteristic, and even with the stiff, large-aggregate mix, dumping is no problem. After the buckets are dumped, the mass is consolidated by large 2-man Chicago Pneumatic electric vibrators.

The top of each lift is left reasonably level, but no special pains are taken beyond walking around with concrete "snowshoes", large plywood foot paddles. The top of each joint is then stripped of all laitance and loose fines by high-pressure wet sandblasting. Depending entirely on the weather and the rate of cure, this is done from 48 to 72 hours after the concrete is placed.

Curing is being done by continuous water sprays for a minimum period of 14 days. With cool, moist nights prevalent in the Pine Flat area of the San Joaquin Valley, excellent curing results are being obtained.

### Wooden Cantilever Forms Used

Heavy-duty wooden cantilever forms are being used to hold the concrete. The panels consist of three 12 x 12 center cantilever uprights, two 6 x 12 cantilever uprights for the ends of each 25-foot panel, and 4 x 6 Douglas fir timber facing bolted onto the uprights to make a form 4 inches thick. The bolt heads are countersunk, and wooden plugs then are used to make the form face smooth. The facing timbers are also drilled to a tight fit for ½-inch rod bolts, which pass through their centers at 2-foot intervals to hold the timbers tightly together. To make room for bottom lap and top freeboard, the facing timbers cover about 5 feet and 8 inches.

*C. & E. M. Photo*

**In the main carpenter yard Pine Flat Contractors set up, there is plenty of electric-powered equipment—including this DeWalt saw.**

Heavy metal straps at the tops of the uprights permit the panels to be lifted or raised. The forms are made up in a central carpenter yard near the aggregate plant, and one of the features which has permitted the rapid fabrication of the forms is a 275-foot cableway with stationary towers and electric hoisting equipment. Heavy forms can be lifted and loaded to flat-bed trucks which take them up to the dam area.

The entire carpenter yard is set up on a mass-production basis. Electric-powered equipment including saws, sanders, and augers is used. In the main yard are a shaper, a Delta table saw, a Yates-American bandsaw, and a DeWalt radial cutoff saw. There are various portable electric-powered Skilsaws. Every form panel is power-sanded and coated with form oil before it leaves for the dam. It has not yet been determined how long the forms will last before they have to be replaced, but at the present time occasional resanding is all they need.

### Personnel

Field personnel in charge for Pine Flat Contractors includes Project Manager Earl M. Jennett and his assistant, Guy Heimsoth. Richard G. Rofelty is Project Engineer; George Archibald is Project Superintendent; Frank Ryan is Master Mechanic; Jim Brown is General Plant Superintendent; Joe Lawrence is Carpenter Superintendent; Glenn Roper is Rigging Superintendent; and Ed Swanson is Concrete Superintendent.

Elmer H. Gruenwald is the Project Engineer for the Sacramento District of the Corps of Engineers.

## Glocke Manager at FWD

Charles Glocke now directs the Service Division of The Four Wheel Drive Auto Co., Clintonville, Wis. He has been with the company since 1934 and has been Field Service Manager since 1945.


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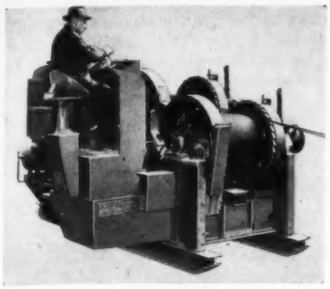


The Iron Workers' Special, a two-drum hoist, is available in three models with single-line pulls of 14,000, 18,000, and 25,000 pounds.

## New Two-Drum Hoist For Steel Erection

A hoist designed for steel erection is announced by American Hoist & Derrick Co., 63 S. Robert St., St. Paul 1, Minn. The Iron Workers' Special features positive load control. A torque converter, antifriction bearings, and air-operated contracting-type tandem-band clutches make it possible for the operator to "feel" his load into position accurately and smoothly, the company says. The brake linkage between the foot pedals and contracting bands is mounted on antifriction bearings for easy operation.

Basically the machine is a two-drum hoist. A third drum and derrick swinger—with surfaces drilled and machined to match—can be added if desired. There are three models available with single-line pulls of 14,000, 18,000, and 25,000 pounds.

Safety features include a back-up brake which engages automatically on reversal of the driveshaft, ratchet rings of forged steel with compression-type dogs, and overload-regulating air valves which permit clutch slippage in case loads become snagged or hung up while being hoisted. The controls of the Iron Workers' Special are on a centralized stand. The stand will rotate, and it is raised high enough to allow the operator to watch the drums at all times, American Hoist says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 326.

## Post-Hole Digger

A post-hole digger with universal mounting for installation on any type of tractor has been developed by Continental Belton Co., Belton, Texas. It comes complete and has its own built-in automatic power lift. One man controls it from the tractor seat.

The Continental digger is equipped with five heavy-duty Timken bearings and steel cut gears working in an enclosed oil bath. Rawhide seals protect the mechanism from dust and dirt. The unit has an automatic depth gage to assure uniform holes.

The universal mounting of the Continental digger makes it possible to install on any tractor with a standard rear power-takeoff shaft. No extras are required, the company says. Exclusive bit points, positive brake control, and a safety shear pin for protection of the machine are other features.

Further information on the Continental post-hole digger may be secured from the company. Or use the Request Card at page 16. Circle No. 341.

A universal mounting makes it possible to install the Continental post-hole digger on any tractor with a standard rear power-takeoff shaft.

## Where-to-Purchase Guide For the Construction Industry

A new 8-page directory containing names and addresses of nearly all principal manufacturers of construction materials and equipment is available from this publication. The where-to-buy section lists hundreds of types of machines designed for use in highway, heavy, and building construction work. The folder is in effect a handy desk-side reference guide which will enable you to spot quickly manufacturers of the equipment you need for the job.

There is no cost, just use the Request Card bound in at page 16. Circle No. 377.


# The "FITZ" CONCRETE HANDLING BUCKET

At last, a bucket designed to pour concrete against the side of a wall — side bottom opening. 1/3, 2/3 and 1-yard capacities — opening can be operated from either side of bucket. 3' overall height from ground level. Easily loaded from any truck mixer — Bucket always vertical regardless of load. Immediate Delivery — $165.00 for 1/3 yard bucket delivered.

*Dealers Wanted*

**FITZGERALD ENGINEERING CO.**

233 South Dixie Highway Coral Gables, Fla.

*Also Mfrs. of the famous "Sewer Scooter."*

# Does two jobs on the double with TIMKEN® bearings

THE photo below shows the new Adams TraveLoader picking up a heavy windrow of material excavated for pavement widening strips on an Illinois state highway. Built by J. D. Adams Manufacturing Company, the Timken® bearing equipped TraveLoader picks up and loads any kind of windrowed material, such as sod, gravel, bituminous mix, or scarified black top. And it actually loads as it travels!

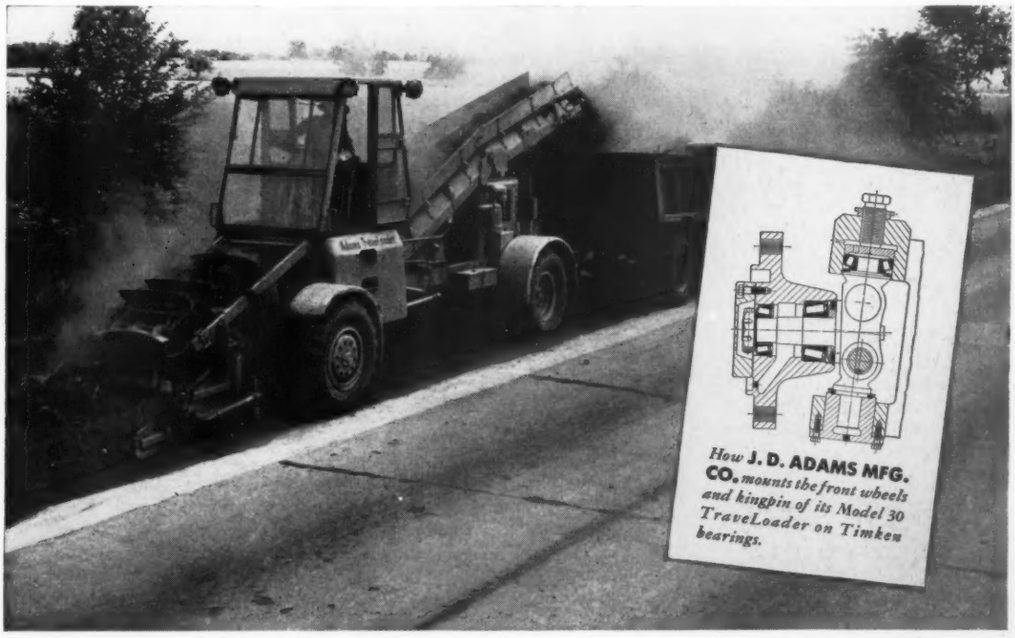
J. D. Adams mounts front wheels, kingpin, upper conveyor bevel gear drive and feeding mechanism bevel gear drive of the TraveLoader on Timken tapered roller bearings. With Timken bearings at these vital points, the TraveLoader is assured long life, minimum maintenance, trouble-free service. Loads are handled faster, with less wear on moving parts.

Timken bearings' true rolling motion plus an extremely smooth surface finish make friction negligible. Line contact between rollers and races gives extra load-carrying capacity. Tapered construction enables Timken bearings to take any combination of radial and thrust loads; moving parts are held in proper alignment.

Timken bearings permit tighter closures that keep out dirt and moisture, keep lubricant in. Maintenance time and material costs are cut to a minimum. And because they are made of Timken fine alloy steel, Timken bearings normally last the life of the machine.

You can get *all* these advantages by specifying bearings with the trademark "Timken" whenever you build or buy. They are backed by over 50 years of bearing research and development. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

*This symbol on a product means its bearings are the best.*



*How* **J. D. ADAMS MFG. CO.** *mounts the front wheels and kingpin of its Model 30 TraveLoader on Timken bearings.*

**IT'S TIMKEN BEARINGS FOR VALUE!**

To get the best value in bearings you may find this simple formula helpful:

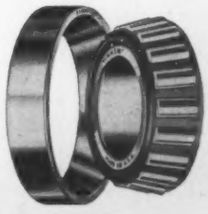
$$Value = \frac{quality + service + public\ acceptance}{price}$$

Obviously a big advantage *above* the line gives you more value than a small one *below*. No other bearing can match the uniform high quality, engineering and field service and overwhelming public acceptance you get with Timken bearings.

TIMKEN

TRADE-MARK REG. U.S. PAT. OFF.

*TAPERED ROLLER BEARINGS*



NOT JUST A BALL ○ NOT JUST A ROLLER ⊂ THE TIMKEN TAPERED ROLLER ⊂ BEARING TAKES RADIAL ◎ AND THRUST →◎← LOADS OR ANY COMBINATION ✳

## New Tailgate Spreader Works by Remote-Control

A self-contained power-operated sand spreader ready to be mounted on the tailgate of almost any type of truck is made by Hall Machine & Iron Works, Inc., Sedro-Woolley, Wash. It is operated by the truck driver from the cab with electric solenoid remote controls. This one-man operation is said to provide safe, simple, and low-cost sanding.

The sander, built in two parts for easy mounting, is a self-contained unit powered by a Clinton air-cooled engine. All gears and chains are protected in dirtproof cases. The rate of speed is adjustable and the unit will sand evenly at speeds up to 20 mph, the company says. The spinners are fed by elevating the truck bed—sand is fed through a large open-throat hopper into the lower spinner hopper by a corrugated roll and a spring-loaded feed gate. The rate of feed can be fixed by setting the gate adjustment. The company reports that rocks up to 2½ inches will pass through the feed gate without clogging or damaging it. The entire unit, it says, can be installed in ten minutes and requires no special mounting or holes.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 258.

**The self-contained power-operated sand spreader made by Hall Machine & Iron Works, Inc., is shown mounted on the tailgate of a dump truck and ready for operation.**

## Form Coating an Aid To Tilt-Up Building

The research laboratory of A. C. Horn Co., Inc., has come up with a unique application of its concrete-form coating, Formfilm. Adapted to the modern "tilt-up" and "lift-up" methods of building construction, Formfilm acts as the separating medium between the floor slab and the newly poured concrete. Applied after the slab has set, Formfilm also acts as an effective curing compound.

The economy of this new method of building construction is derived from the use of the floor slab as a form—for the walls in "tilt-up" construction and for the roof in "lift-up" construction. The footings, foundation, and ground floor are built in the conventional way. The wall panels—or roof—are then poured on the dried floor slab which serves as a part of the form. This eliminates the usual forms and bracing; only edge forms are needed. The panels are then tilted—or the roof is lifted—into place. (See C. & E. M., October, 1949, page 41, and July, 1950, page 31, for details.)

In this method a separating medium is required to prevent a bond between the slab and unit poured on top of it. Horn says that its Formfilm effectively prevents bond, that it is easy to apply, and that it leaves a finish which requires no further treatment. The manufacturer also points out that, when desired, paints may be applied directly to surfaces on which Formfilm has been used.

Further information on the use of Formfilm may be obtained from A. C. Horn Co., Inc., 10-10 44th Ave., Long Island City 1, N. Y. Or use the Request Card at page 16. Circle No. 350.

## Powered Concrete Buggy

A circular describing the Concrete-Truk, a mobile gasoline-powered concrete buggy, is available from Monroe Sales Corp., 333 Midland Ave., Detroit 3, Mich. It provides all details, complete specifications, and dimensioned drawings of the unit.

The literature points out that this machine may also be used for materials handling. The all-welded steel box carries 14 cubic feet of concrete or a 3,000-pound load. Powered by a Wisconsin engine, the Concrete-Truk has 3 speeds forward, up to 15 mph, and one reverse speed of 7 mph.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 307.


Today it's HENDRIX!

Men Who Watch Costs Specify HENDRIX Dragline BUCKETS

3 TYPES FOR EVERY DIGGING PURPOSE

3/8 to 40 CU. YDS.

The records prove it . . . that Hendrix Dragline Buckets stay on the job longer and keep maintenance costs down. This is partially due to the all-welded construction . . . the design that eliminates "dead weight," yet strengthens the unit for unsurpassed performance on any job. In a large measure, too, it is the painstaking care, special engineering techniques and years of "know-how" that guard and maintain Hendrix's quality leadership.

Smart operators specify Hendrix Buckets again and again . . . they know!

HENDRIX Lightweight DRAGLINE BUCKETS

Hendrix Buckets Also Available WITHOUT PERFORATIONS

HENDRIX MANUFACTURING CO., Inc.

MANSFIELD — LOUISIANA



SASGEN

New Electric-Powered CHAMPION DERRICK

Boom only can be supplied for use with old-style Mast and bottom

Single line cap. 300# @ 100 feet per minute

Double line cap. 600# @ 50 feet per minute

The most complete line of contractors' derricks, hoists, and winches. Write for catalog.

The Sasgen line is handled by leading equipment distributors everywhere.

SASGEN DERRICK COMPANY
3131 W. Grand Avenue, Chicago 22, Ill.

# Portrait in Print

By BILL QUIRK

## Contractor Paces Community Growth

• NASSAU County, New York's fastest-growing suburb, has increased its population 63.6 per cent in the last decade. While the growth of a contracting firm is not so readily measured percentage-wise, it is no exaggeration to say that the county's leading contractor, Arthur Hendrickson of Valley Stream, is on even terms with that growth, if not out in front setting the pace. For Hendrickson Bros., Inc., has for years been considered Long Island's largest general contractor in excavating, grading, and heavy-construction work.

Now 58, Arthur Hendrickson is President of the firm that includes his two younger brothers—Frank, 55, who heads the purchasing department, and Freeman, 50, General Superintendent of construction. Each of the brothers also has a son working for the company. Sincere and friendly, Arthur Hendrickson has put a lot of himself into a business that now handles millions of dollars worth of construction a year for public and private clients. He is a quiet man, deliberate in speech and action, who imparts a sense of reserve strength. and a feeling that he would always be in full command of any situation in which he might find himself.

A little under 6 feet in height, Hendrickson is a stocky 200-pounder with

*(Continued on next page)*

*C. & E. M. Photo*

**The small jobs aren't too small for Arthur Hendrickson, though he deals often in seven-figure projects. He has 700 on the payroll of his Valley Stream, Long Island, firm, so he is a consistent bidder. .**


## BARCO DISTRIBUTORS

| BARCO GASOLINE HAMMERS | BARCO "PEGSON" RAMMERS |
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Ala., Birmingham, The Brady Company.
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Buffalo, T. E. Potts Equipment Co.
Long Island, Stillwell Supply Corp.
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**BARCO MANUFACTURING CO.**
**Chicago 40, Illinois**

# NOW! BARCO Gasoline Hammer —with new ignition, new handle design

• ONE MAN OPERATION!
• NO OTHER AUXILIARY EQUIPMENT NEEDED!

*More Portable!*
*Greatly Improved Operation!*

**NEW IGNITION!** Here are the quick facts: (1) Special sealed coil, vibrator, and condenser all now housed in handle—easily replaceable as a unit, (2) Short (5") high tension lead, (3) Continuous vibrating type vibrator not dependent on timer point contact, (4) Faster initial spark, (5) Quick, easy starting under all weather conditions!

**MORE PORTABLE THAN EVER!** Less total unit weight. New quick disconnect for cable at handle. Coil box eliminated and lighter cable to battery. Easy to take hammer to any location by truck, car, or air!

**INCREASED OPERATING CONVENIENCE!** New simplified arrangement of parts. Ignition switch placed beside operator's thumb.

**ASK FOR A DEMONSTRATION!** Your nearby Barco distributor will be glad to give you a demonstration. *Ask about conversion kits for incorporating these latest advanced features into your present Barco hammers.* BARCO MANUFACTURING CO., 1818-H Winnemac Ave., Chicago 40, Ill. In Canada: The Holden Co.

*IMPROVED MODELS AVAILABLE NOW:*
Standard Model J-2. Weight, 72 lbs. Up to 1550 strokes per min.
Heavy Duty Model H-6B. Weight, 89 lbs. Up to 1550 strokes per min.

PAVEMENT BREAKING • ROCK DRILLING • ROD DRIVING • CUTTING • TAMPING

*FREE ENTERPRISE*—THE CORNERSTONE OF AMERICAN PROSPERITY

## Contractor Paces Community Growth

(*Continued from preceding page*)

grey hair and a humorous twinkle to his eyes. He is a solid citizen too, having once served a term as mayor of Valley Stream where he was born. "As a boy," he reflected, relaxed in his office easy chair, "I knew every man, woman, and child in the village, but how many people can you now hope to know out of a population of nearly 30,000?"

### Started With Father

John C. Hendrickson, father of the Hendrickson brothers, went into the contracting business in 1905 on grading and excavation jobs, together with an occasional timber bridge. Valley Stream was then a quiet village in an area primarily engaged in agriculture. John's father was a farmer in that section of Long Island. The old family homestead, where the boys were born, still adjoins the present modern headquarters of the firm.

After Arthur had graduated from the local grammar school, he went to work for his father. Though not yet 14 he was a husky boy, and strong enough to handle a team of horses. "We did the heavy work with actual horsepower or manpower in those days", Hendrickson recalled. "As a teamster I dug cellar foundations with a drag scraper, graded land, or cut streets through farmlands in some of the early real-estate subdivisions on Long Island."

From teamster the hard-working young man advanced to foreman, acquiring in the process a thorough knowledge of the contracting business as it was carried on nearly forty years ago. Arthur Hendrickson has never stopped learning the contracting business nor has he ever worked at anything else. When he was twenty, his father took him into the business as a partner, adding the "& Son" to the John C. Hendrickson name. Five years later the father sold his interest to Arthur who operated as a private individual from 1918 to 1922.

### Steady Growth

Long Island was growing steadily, and consequently contractors were kept busy building the roads and facilities for the increase in population. In January, 1923, Arthur incorporated the business under its present title of Hendrickson Bros., Inc. It proved to be a wise move, as the expanding company was ready to undertake, for example, large contracts for highways and parkways that have since spread like the green bay tree throughout Nassau and Suffolk Counties on Long Island.

Although the company has worked on projects spread geographically from Maine to Maryland among the northeastern states, Hendrickson is partial to Long Island. That is not difficult to understand. Within about an hour's drive from headquarters in Valley Stream, the company is engaged on projects totaling nearly $15,000,000. Biggest current job, now nearing completion, is the $6,206,805 Bay Park Sewage Disposal Plant for Nassau County. It will serve 53 per cent of the county's total population of 665,746. This construction required an involved procedure of building a heavy foundation on reclaimed marshland rendered stable with hydraulic fill.

Hendrickson Bros. was also awarded all three contracts for installing a trunk sewer, 13 miles long, connecting with the disposal plant. The line includes concrete sewer pipe up to 84 inches in diameter laid in trenches 22 feet deep in places. These contracts totaled approximately $3,000,000, and required wellpoints nearly all the way because of the high water table.

### Public and Private Work

As for road work, the company has at present two new state parkway contracts amounting to $3,250,000. One covers a 4-mile stretch on the Sagtikos Parkway, and the other a 3-mile section of the Captree Causeway. The work includes everything from clearing on through grading, drainage, grade-separation structures, and paving.

In the building line Hendrickson Bros. is constructing at Merrick, on the south shore of Long Island, a refuse-disposal plant for the Town of Hempstead. Across the island at Glenwood Landing on the north shore, the contractor is working on a new substation for the Long Island Lighting Co. Hendrickson's part in these public and private facilities will run to around $1,500,000.

Besides these major projects, the company has a goodly scattering of other contracts obtained from town, village, county, or private agencies. Most big general contractors who handle million-dollar projects shy away from the small jobs in the few-thousand-dollar class. Not so Hendrickson Bros., Inc. The company is a consistent bidder, submitting several estimates a month on medium or small-sized jobs that are advertised for letting. A $5,000 or $6,000 contract is figured as carefully and welcomed nearly as keenly as the big projects up in seven figures.

### Large Personnel

This eager-beaver chasing down of the small next-to-nothing-profit jobs is understood after learning of the large personnel force employed by Hendrickson. With 700 on the payroll, the estimating department must be busy with sharpened pencils, pruning here and there to see that the company gets its share of the work being let. In January of this year for instance, usually a slack month in construction

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**The Newest, Finest Tractor Line on Earth**

The new Allis-Chalmers tractors are not just refinements of existing models . . . *they are new from the ground up* . . . without compromise anywhere in design or materials. Back of their design are your own ideas and those of your operators and mechanics. These are combined with the vast experience of Allis-Chalmers to set new standards of Performance, Durability, Simplified Servicing, Ease of Operation.

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*Originator of the Torque Converter Tractor*

circles, Hendrickson Bros., Inc., was low bidder on six out of ten projects, obtaining work totaling $359,952. Of this group the largest bid was under $90,000.

Hendrickson employees are greatly interested in the results of lettings. The company publishes a monthly house organ called "Hendrickson News", a well edited paper that includes a summary of these bids. Successful ones may be titled "Yes", "Again", "Made It", while the too-high bids may be headed "No", "Not Quite", or "Also Ran". Keeping the employees informed of what the company is doing makes for good understanding between labor and management in any kind of business.

To keep the wheels of construction rolling, Arthur Hendrickson has over 250 major pieces of construction equipment to team up with the contracting know-how of those 700 employees. Company headquarters on a 5-acre site in Valley Stream include a shop 260 feet long x 60 feet wide, with enough headroom to admit the largest shovel or crane. Here the big fleet of construction machinery is maintained by a double crew of mechanics, fifteen to a shift, working from 7 a. m. to 3:30 p. m., and from 4 p. m. to 12:30 a. m. With the jobs fairly close to headquarters, Arthur Hendrickson finds it more efficient and economical to bring equipment into the shop for overhaul and repairs than to attempt such work out in the field.

### Men and Machines

Arthur Hendrickson is a thinking executive who anticipates conditions and situations and acts accordingly, rather than waiting for things to happen before coping with them. Such foresight has been applied to both machines and men. It is the company's policy, he explains, to progress as steadily and continuously as economic conditions will permit. Hendrickson has always tried to acquire up-to-date equipment in sufficient numbers to meet job conditions in the most economical way. Yet he is careful to buy nothing that will not be used to good advantage.

As for men, Hendrickson long ago developed a plan whereby a job or department would not be seriously crippled if a key man were lost through accident, sickness, death, or a call to military service. By what is termed "schooling a man", the key figure takes under his wing an assistant or understudy who is trained to learn the duties of the superintendent or depart-

*(Concluded on next page, col. 2)*

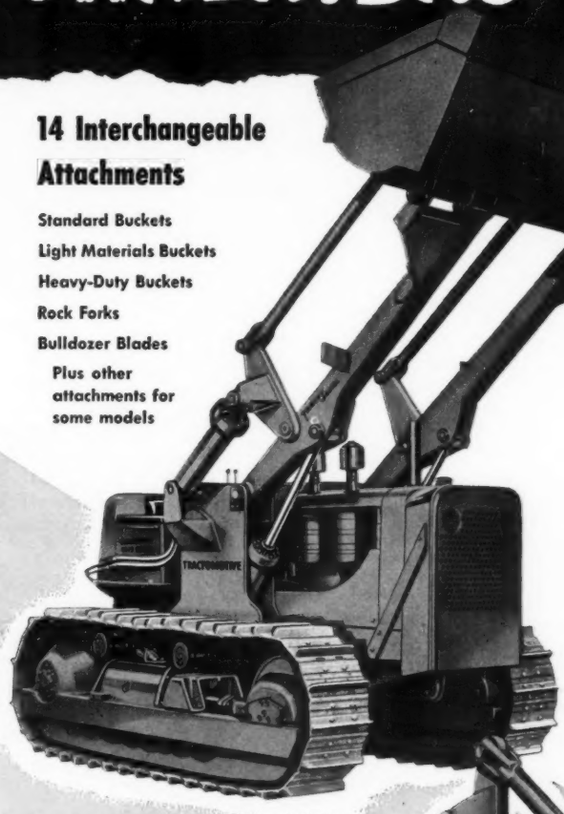

# nt End Shovels for the Complete Line
# Allis-Chalmers Tractors

**14 Interchangeable Attachments**

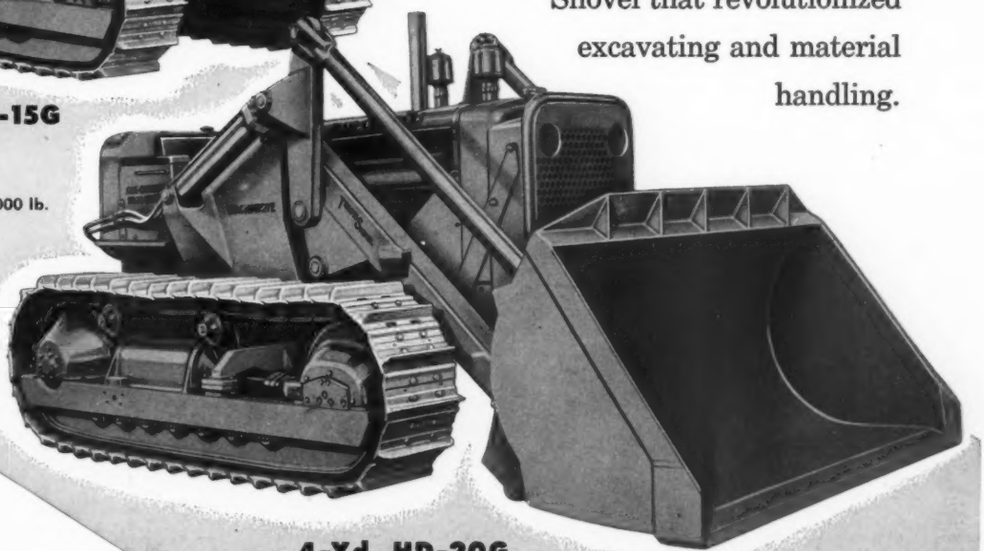
Standard Buckets
Light Materials Buckets
Heavy-Duty Buckets
Rock Forks
Bulldozer Blades
Plus other attachments for some models

## Introducing a New Era of Tractor Usefulness

These new Tractomotive shovels on the larger size Allis-Chalmers tractors now bring you the same wide utility, the same outstanding performing ability as the popular HD-5G—the Tracto-Shovel that revolutionized excavating and material handling.

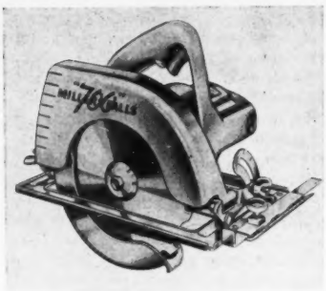


**3-Yd. HD-15G**
Drawbar hp.: 102
Dumping Height*: 12 ft. 8 in.
Total Weight: 40,000 lb.



**4-Yd. HD-20G**
Hydraulic Torque Converter Drive — 175 net engine hp.
Dumping Height*: 13 ft. 5 in.
Total Weight: 61,600 lb.

*Height of bucket hinge



The Millers Falls No. 700 7-inch portable electric saw will make 45-degree miter cuts on 2-inch finished lumber. It weighs 11 pounds.

## New Seven-Inch Saw

A 7-inch portable electric saw has been introduced by Millers Falls Co., Greenfield, Mass. It weighs 11 pounds and has a capacity of 2⅜ inches at 90 degrees. The saw will make 45-degree miter cuts in finished 2-inch lumber, the company says. Simple adjustments are provided for depths of ¾ to 2⅜ inches at 90 degrees, and angles of 45 to 90 degrees. An adjustable ripping gage is mounted on the toe of the base. Safety is provided by a completely guarded blade and quick trigger-switch control.

Using abrasive disks, the No. 700 saw can cut metal, concrete, tile, etc. Any standard 7-inch blade or disks with ⅝-inch arbor holes may be used. A ½-hp universal-type motor supplies the power, which is transmitted to the saw through precision-cut helical gears. Ball bearings are used throughout. The motor housing, handle, and saw guards are aluminum-alloy castings.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 334.

## Vibrators and Screeds

The Stow line of vibrators and screeds is reviewed in an 8-page bulletin released by Stow Mfg. Co., 40 Shear St., Binghamton, N. Y. These machines are said to permit early form stripping and removal to eliminate hand puddling and patching, and to enable early finishing of surfaces.

The complete line, which includes heavy and light-duty gasoline vibrators and the new electric vibrators, is described in the bulletin. The uses and specifications for each model are given. Additional data are supplied for Stow flexible shafting and for vibrator heads and accessories. The back cover describes the improved Stow vibrating screed which, the company claims, permits placing more than 300 cubic yards of 8-inch slab in less than 8 hours. All the machines and accessories are illustrated.

This literature may be obtained from the company by requesting Bulletin 511, or by using the Request Card at page 16. Circle No. 278.

## Contractor Paces Community Growth

*(Continued from preceding page)*

ment head. Thus the replacement is ready to take over at a moment's notice the bigger assignment, if and when he is called upon. This plan has worked well in practice, for the man imparting the knowledge has a two-fold incentive to train his understudy thoroughly. In the first place it is for the good of the company which, under a man like Arthur Hendrickson, stands for the welfare of the individual too. Secondly the key man, if he happens to be sick or wants a vacation, need not worry about his department going to pieces or work piling up until his return.

This employee confidence is also demonstrated in the meetings of the executive supervisors and engineering force that Arthur Hendrickson holds monthly at company headquarters. Average attendance is about 75. Such topics are discussed as current job problems, prospects of new work, news of the day and its effect on construction. and, of course, profit-and-loss statements. The group gatherings take place in the finished basement of the company office building in a spacious room that serves also for recreation and social get-togethers.

### Old and New

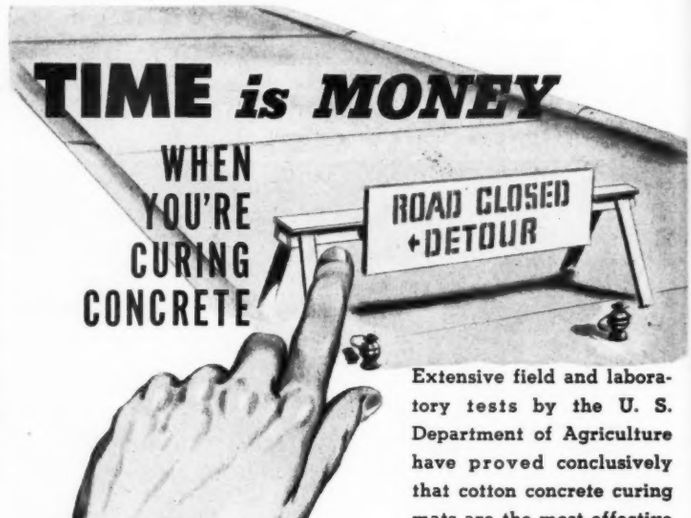
This building, originally a one-family house built by an uncle of Hendrickson's over fifty years ago, has been reconstructed three times to meet the growing demands for space. The neat red-brick two-story structure, measuring 30 x 70 feet, is now getting another addition—a two-story 20-foot-wide brick extension running the length of the building. It contains bookkeeping, purchasing, engineering, estimating, cost-accounting, and time-keeping departments, together with private offices for executives. The office force numbers 30.

In addition to the contracting business, Hendrickson Bros., Inc., has an interest in Rason Asphalt, Inc., a commercial blacktop plant at Cedarhurst, Long Island, and the Nassau Docks, a private wharf for unloading and handling sand and gravel aggregate.

Despite the uncertain outlook facing construction in an uneasy war-weary world, Arthur Hendrickson refuses to take a pessimistic viewpoint. He sees no reason for contractors to become unduly alarmed, and feels that the production of all kinds of goods must increase in this country, and that construction too must continue its forward progress. The serene confidence of the man is contagious. More than just Valley Stream and Long Island are hoping that he will be once again proved right.

## Oberlink Vice President

Boyd S. Oberlink has been elected a vice president in the Tractor Division of Allis-Chalmers Mfg. Co., Milwaukee, Wis. Mr. Oberlink, who joined Allis-Chalmers in 1934, was formerly Assistant to the Executive Vice President in charge of the Tractor Division.


Extensive field and laboratory tests by the U. S. Department of Agriculture have proved conclusively that cotton concrete curing mats are the most effective means for curing concrete. With Fulco Cotton Concrete Curing Mats you save both time and money. Fulco mats stay wetter longer (usually one wetting is sufficient), insulate against sudden temperature changes, and are economical because they may be used over and over again. Sturdily made of tough cotton with stitched edges and seams and filled with cotton padding weighing 12 oz. per square yard, Fulco Mats will cure your concrete quicker, better, and cheaper! See your equipment dealer or wire direct for prices.

Fulton also manufactures sturdy, top quality Triple Strength Tarps, drop cloths, and tents, indispensable protection at economical prices.

Fulton BAG & COTTON MILLS

Atlanta • St. Louis • Dallas • Denver • Kansas City, Kans. • Minneapolis
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WON'T QUIT
or cause time out

A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

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The Hayward Company
32-36 Dey Street
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Hayward Buckets

Greater Facilities . . .
Building heavy duty Crushing Plants for all over the world . . .
Your Assurance of
PROMPT DELIVERY!
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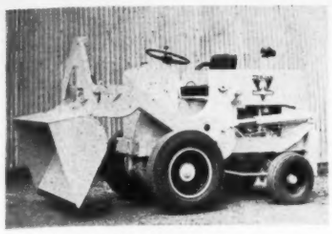


The LA-40 Loadster made by Contractors Machinery Co. has a 10-cubic-foot struck bucket capacity.

## Materials Handler

A unitized loader for handling bulk materials is manufactured by Contractors Machinery Co., Inc., Clinton St., Batavia, N. Y. The LA-40 Loadster has a struck bucket capacity of 12 cubic feet. It is powered by a 133-cubic-inch engine which develops 31 hp at 1,800 rpm, and it has a heavy-duty 11-inch clutch, a 2-speed transmission with independent directional lever, internal expanding hydraulic brakes on the drive wheels, and a gear-type hydraulic pump for the lifting mechanism.

Four-wheel-mounted, the Loadster has two forward and two reverse speeds. It has a maximum dumping clearance of 4 feet 5 inches and a turning radius of 7 feet 3 inches. The rear-wheel steering is designed for maximum maneuverability in close quarters. A single hydraulic control lever governs all bucket motions — raise, lower, close, and dump—and a double-acting ram provides bucket tilt-back action independent of hoisting.

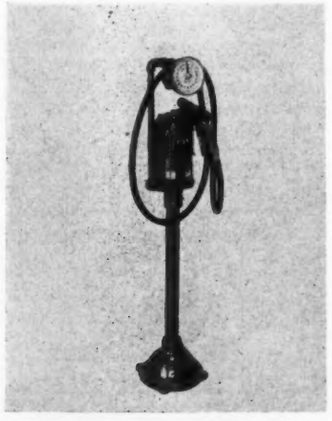
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 263.

## New Refueling Pump

An electric-power refueling pump is made by Ossian Engineering Co., Ossian, Ind. This Fill-Rite Model PM-622 pumps up to 12 gpm and has high suction lift, the company says. It has a ⅝-inch x 9-foot hose with ¾-inch male-pipe-thread couplings and a standard refueling-type nozzle. Its ¼-hp thermal-protected motor is explosion-proof.

The pump is simple in construction. Its motor and pumping chamber are bolted together and permit a direct-drive rotor which makes the unit compact. The fiber-type pump vanes adjust automatically to compensate for wear. A mechanical rotary carbon seal is designed to eliminate leakage and binding. The interlocking nozzle and switch mechanism is a theft-protection feature; the pump can be locked with the switch off and with the nozzle in its protective housing. Fill-Rite pumps are available with or without the standard 6-inch 20-gallon dial meter, and with or without a pedestal.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 299.



This Fill-Rite Model PM-622 electric-power refueling pump handles up to 12 gpm and has high suction lift.

## Prestressed-Concrete Meeting

More than 35 engineers and architects will speak at the first U. S. conference on prestressed concrete to be held August 14 to 16 at Massachusetts Institute of Technology, Cambridge, Mass.

The purpose of the conference is to outline the present status and potentialities of prestressed concrete in American practice. The sessions on Tuesday, August 14, will deal with applications—for tanks, pipes, bridges, buildings, and pavements. The morning session on Wednesday will complete the discussion of applications—for piles and mass-produced units. Wednesday afternoon the speakers will take up materials—concrete, wire, and bars. Thursday morning and afternoon will be given over to design and research.

Cosponsors cooperating with M. I. T. include the American Concrete Institute, the American Institute of Architects, the American Railway Engineering Association, the American Society of Civil Engineers, the Associated General Contractors of America, and the Portland Cement Association. The M. I. T. departments of architecture, civil engineering, and of building engineering and construction will be hosts. Professor Myle J. Holley, Jr., is Conference Coordinator.

Further information may be obtained from Professor Holley at Room 1-230, M. I. T., Cambridge 39, Mass.

## All-State Builds

Construction of a new building is well under way at the site of the home office of All-State Welding Alloys Co., Inc., White Plains, N. Y. The structure will more than double the present factory area. It will also provide additional laboratory and engineering facilities for the company's Technical Division.


"BERG" Concrete Surfacer

A light-weight, portable, electric motor-driven Concrete Surfacer consisting of the Model R-2 Right Angle Head and Model AS Motor Unit

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## Decker Succeeds Black

Alonzo G. Decker, cofounder of Black & Decker Mfg. Co., Towson, Md., succeeds S. Duncan Black as President. Mr. Black died on April 15. Mr. Decker has been Vice President and General Manager of the portable-electric-tool firm since he helped found it in 1910.

Robert D. Black has advanced to Vice President from Vice President in Charge of Sales; Glen H. Treslar, Vice President and Sales Manager, is now Vice President in Charge of Sales.

## A Protective Shunt For Blasting Caps

A protective plastic shunt for Western Electric blasting caps is made by the Explosives Division, Olin Industries, Inc., East Alton, Ill. It is a sleeve of nonconductive plastic which is slipped over the bare ends of the leg wire to minimize corrosion. The wires remain bright and it is unnecessary to scrape them before wiring up a shot, the company says. The wire is bent to prevent the plastic sleeve from slipping off. The shunt, which can be removed easily when required, leaves the wires straight, ready to be connected in the firing circuit.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 298.

## Diesel Lift Truck Has Hydraulic Drive

A fork-lift truck, powered by a diesel engine and equipped with a hydraulic transmission, is announced by The Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa.

Designed primarily for use outdoors or where fire hazards exist, the truck utilizes a Hercules 6-cylinder diesel engine with a continuous rating of 70 hp. It is equipped with standard Bosh governor controls. All power impulses from the engine are transmitted through a double-impeller fluid coupling. The resulting smooth operation lengthens clutch life 5 to 8 times and reduces wear and tear on other vital truck parts, the company says. The power plant also has large hypoid gearing of the type found in over-the-road highway carriers. Hydraulic brakes provide smooth stops. The diesel engine reduces fire hazards, and a condenser-type water muffler screens out sparks in the exhaust gases for further safety. While diesel exhaust fumes are admittedly nauseous, they are less dangerous than gasoline exhaust fumes in closed areas.

Structurally, the Diesel-Lift is built of pressed plate and bar steel, formed to shape, and electrically welded into a unit structure. A long wheelbase and wide wheel treads provide stability. Chassis clearance is over 9 inches. The undercarriage operating and steering connections are cadmium - plated against corrosion. All assemblies are said to be easily replaced or serviced.

The Diesel-Lift fork truck, made by Yale & Towne Mfg. Co., is powered by a Hercules diesel engine and has a fluid transmission.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 374.

## Bulletin on Car Movers

The large-size contractor and producer of materials with car-moving and spotting problems will be interested in a new bulletin prepared by Webster Mfg., Inc., Tiffin, Ohio. Bulletin 60E covers the complete line of Webster car movers. It points out that although originally designed for moving or spotting railroad and industrial cars, the Webster car movers may also be used for other types of moving work. The line is composed of several types and sizes of fixed and portable capstan models as well as a range of drum and continuous-type units. The 32-page indexed bulletin illustrates and describes each car mover and its accessories in detail.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 309.


For the life of your

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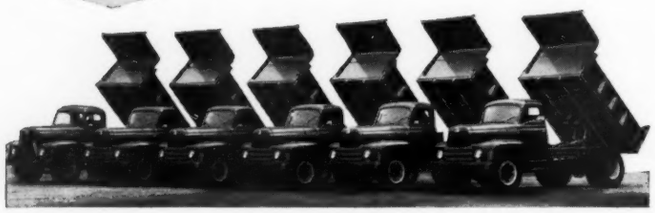

● During these days of uncertain deliveries, many trucks, bodies and hoists are carrying heavier-than-usual work-loads . . . under conditions that place extra stress and wear on valuable equipment.

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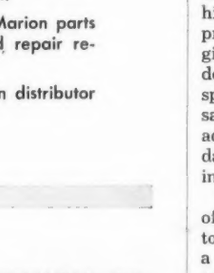

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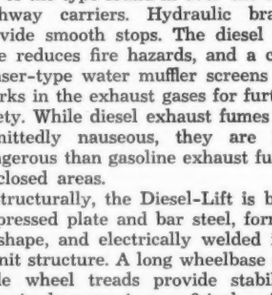

**HARDY SELECTOR CABINET**
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# Bituminous Knacks Repair Desert Roads

## Several Practical Methods Work Well When Applied to the Maintenance of Highways Through California Desert

• EAST of Barstow, Calif., U. S. 66 passes 180 miles through a remote desert before it reaches the Colorado River. It is a monotonous, lonely road. Tourists remember it chiefly because they can drive fast on its well maintained asphalt surface.

That stretch of road, along with several others in San Bernardino and Riverside Counties, is well maintained only because maintenance men have learned over the years what tricks will work. As a matter of fact, District VIII of the California Division of Highways at San Bernardino has pioneered several maintenance methods from necessity, which other districts and county road departments now use.

Maintenance men and their engineer-supervisors explain how necessity forced the development of methods, by pointing out many features of these desert highways. They pass for the most part through semiarid country, where road-building materials are plentiful. Original designs were therefore very moderate. Some of the roads to this day consist of bituminous road-mixed surfaces, laid on a natural base graded in the desert floor. Today a higher type of construction is done, but despite hot weather and heavy traffic some of the old surfaces have worn well.

During World War II, several training camps were established in District VIII. The highways were soon subject to additional punishment from long motor-truck convoys. These training maneuvers accelerated the failure of bituminous surfaces, and mothered through necessity the maintenance methods which have worked so well.

### The Annealing Trick

A characteristic type of bituminous failure through the desert is slow oxidation. It causes asphalt to become brittle, and checkerboard cracks develop rapidly on an oxidized highway. If heavy traffic rolls at high speed over an oxidized road, mere seal coating will not correct the difficulty.

Maintenance men have found something that puts new life in the cracked asphalt, and anneals the crack edges together again. They scoop native aggregate from the desert floor, screening it occasionally if that is necessary. In the hot summer months they put from 4 to 6 per cent of SC-4 in this material, and premix it thoroughly with motor graders. The premix is then hauled in by trucks in sufficient quantity to lay about 4 pounds per square foot.

The old surface is prepared for annealing by a heavy tack coat—usually about 0.1 gallon per square yard—of MC-3. Then the premixed material is bladed over the road. The secret of a good annealing job is plenty of rubber-tire rolling. This type of compaction seems to knead the new material in with the old, and inspection of a finished job shows plenty of new "life" in the old asphalt.

Annealing jobs are usually followed immediately by upper-deck or half-sole resurfacing. Since most California state highways carry constant traffic, rather short sections have to be worked at a time, with flagmen at both ends to route cars around the work. Pilot cars are also often used. Sections under betterment are usually from 1,000 feet to a mile in length.

*California Division of Highways Photo*

**Oxidation, heavy traffic, and only a fair subgrade confront California District VIII maintenance men with this sort of problem.**

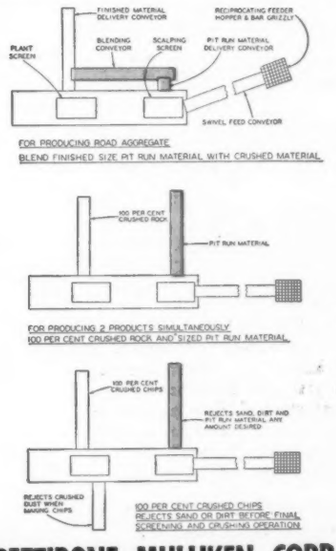
### Upper-Decking

Upper-decking, or bituminous resurfacing, is often done by maintenance forces where the thickness will not exceed 1 inch compacted. Resurfacing more extensive than that is done by contractors.

Native desert material again enters the maintenance picture for upper-decking. It is so plentiful and so well graded that it can often be used without any screening whatever. It is truck-hauled to the highway, after front-end tractor loaders scoop it up off the desert. Motor graders blade-mix the windrow to blend the material. Bitumen is almost always SC-4. That type of

*(Concluded on next page)*

PRODUCT COMBINATIONS TO FIT A VARIETY OF JOBS


FINISHED MATERIAL DELIVERY CONVEYOR
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Pit run material of finished size is pre-screened and does not pass through the main plant. You get **Free Aggregate** which increases over-all production 50 to 100%. The main plant screen sizes crushed material only and is not burdened with natural finish. Top crushing capacity is provided by Universal's exclusive TwinDual Method which divides the crushing load between three crushing stages: First stage - 18" x 24" or 20" x 36" Jaw Crushers, Second and Third stages - 24" or 30" TwinDual Roll Crushers.

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## Bituminous Knacks Repair Desert Roads

*(Continued from preceding page)*

asphalt cures satisfactorily if it is handled right, and it holds its life much longer than medium-cure cutbacks where it is exposed to desert heat. From 4 to 6 per cent is used, depending on the fineness of the aggregate.

After the windrow in a section is blade-mixed, it is laid down and rubber-tire rolled. Almost all this mixing is done by motor graders, although occasionally the Division of Highways rents mechanical mixers if the work load gets heavy.

### Fast Armor-Coat Work

One of the favorite, low-cost maintenance tricks in District VIII is armor coating, or seal coating, which costs only $225 a mile. Skilled motor-grader operators and the supply of desert material have made this trick possible.

The seal coat is started by shooting 0.1 gallon of MC-3 or 0.08 gallon of SC-4 per square yard. That's right, they do use SC-4 as a seal! Motor graders then start from the shoulder and screen a windrow of desert material out across the fresh asphalt. The wheels never touch the asphalt . . . the operators keep shoving the screenings ahead of the point of the blade. When a tight blade is held close to the fresh asphalt, fines drop down into the hot stuff and coarse rocks roll ahead toward the far side of the pavement. When the grader gets through, nothing is left at the far side but a tiny windrow of larger-sized rock.

From 2 to 3 drag brooms now move in. The seal coat is broomed for at least 6 hours, often more. Dust is something of a problem for a few hours, ordinarily, but heavy drag-brooming soon eliminates it.

Surfaces treated in this way are skid-resistant, tough, and durable. They reflect light at night. It takes only 2 motor graders, 3 trucks, one 2,500-gallon tank truck equipped with a spreader bar, and a minimum of labor to apply this type of seal coat at a high rate of speed.

### Everything Mechanized

Maintenance in District VIII is highly mechanized, and every day that passes sees less hand labor. They have done away with pullgraders and brought in motor graders instead. All the tractors now have dozer blades, because there is always work for a dozer, and tractors don't stand around any more. On the seal-coating work, for example, the trucks don't work just part time. After they have finished hauling cover material they hook on to the brooms.

Shoulder work used to be a hand-labor job, but today fast rubber-tired tractors pull Adams mechanical shouldering machines at high speed. Even snow removal has been carefully studied, and its mechanization is slanted at the individual problem in District VIII. The District uses light push plows as much as possible, and removes the windrow with 7 Snogo rotaries. Most of the snow occurs in mountainous resort areas, so this is a perfect solution to that problem.

District VIII includes about 1,337 miles of road in all of San Bernardino and half of Riverside County. Nearly everything is surfaced now. There is some portland-cement-concrete pavement, but for the most part the surfaces are plant-mix and road-mixed asphalt. Maintenance men have naturally learned the most about bituminous upkeep.

The reactivation of many of the military camps nearby, along with heavier and heavier highway loads, is causing all maintenance crews to step up summer work. The California Highway Patrol is helping greatly to enforce weight limitations on state highways.

Maintenance work is under the supervision of G. E. Malkson, and S. W. Lowden is District Engineer. George F. Hellesoe is Maintenance Engineer for the California Division of Highways.

## Heads Asphalt Research

John M. Griffith is now Engineer of Research for The Asphalt Institute, New York City. He succeeds to the post held until recently by Prevost Hubbard, who retired as head of the Institute laboratory and field research. For the past eight years Mr. Griffith has been with the Flexible Pavement Branch of the Waterways Experiment Station at Vicksburg. Since 1947 he has been Chief of the Bituminous and Chemical Section of the Branch.

## Building Research Institute

The Building Research Advisory Board has created a complementary and supporting organization called the Building Research Institute. The Institute's membership will come from the building industry, and it is expected that it will act as a liaison between BRAB and the industry. Its program includes a publications service and plans for forums on current research topics.

Membership in the Institute is available under the five following classifications: (A) Manufacturers, (B) Contractors, (C) Associations, (D) Participating memberships, (E) Professional memberships. Further information may be secured from the Building Research Advisory Board, National Research Council, 2101 Constitution Ave., Washington 25, D. C.


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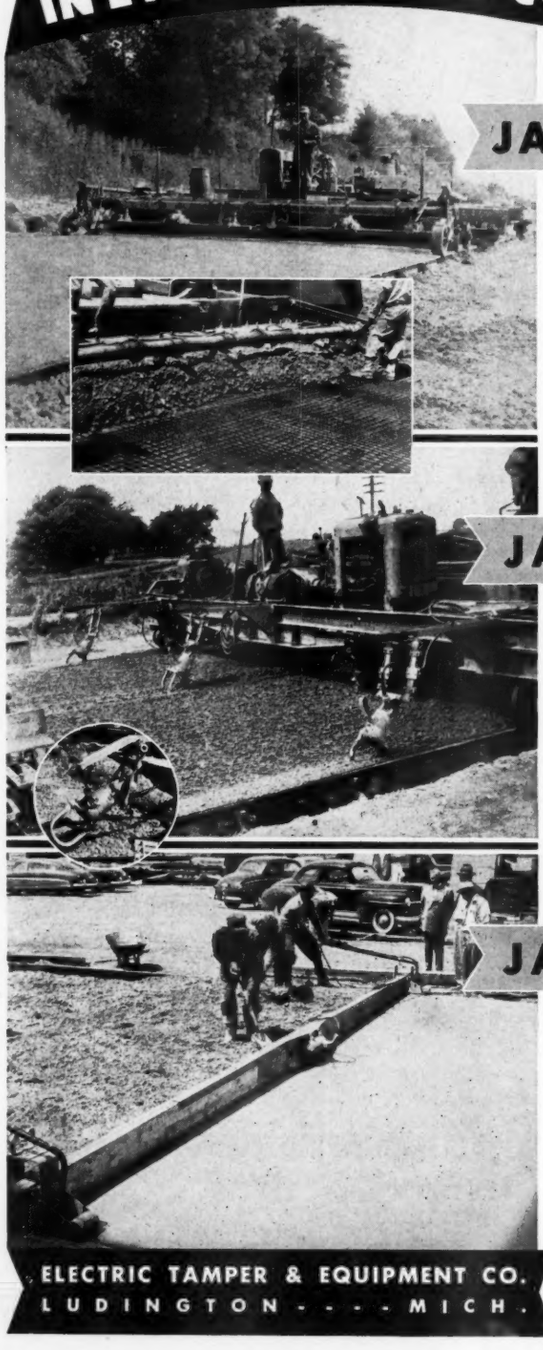

HIGHWAY and AIRPORT

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The JACKSON Paving Tube, which is quickly attached to any standard finisher, provides full width internal vibration through full depth of the slab. The harsher mixes are readily made plastic. Important savings in cement can be made, or important gains in compressive strength and durability achieved when no cement reduction is made. Spreading costs are reduced, finishing progress is much more rapid, complete compaction is accomplished and concrete is perfectly puddled at side-forms and joints. It is adaptable to slabs 6" to 24" thick and quickly adjustable from 10' to 25' widths, in the field. May also be attached to standard spreaders for vibrating the first course in thick slab construction. Write for complete details.

JACKSON SIDE FORM VIBRATOR

Eliminates manual vibrating of concrete at side forms. Saves the better part of two men's labor. Mounts on any modern finisher, Jackson Vibratory Paving Tube or Spreader. Employs two or more vibratory units which are simultaneously lowered into or raised from the concrete by the finisher operator. Units operate close to forms or reinforcement, ride over any obstruction without fouling. Will not penetrate into sub-base. Assures thorough compaction regardless of speed of finisher, no spots missed. Long-wearing, trouble-free. Write for complete facts.

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Strikes off to any crown, undercuts at curb or side-form, works right up to and around manholes and other obstructions. With it center joints may be eliminated and full widths (up to 30') poured. Requires only two men on widest slab, due to strong tendency to propel itself. It's the only screed that can be rolled back on 4 rollers for second pass. Contractor has only to secure plank cut to proper length and crown to be set for any job. Powered by Jackson 1.25 KVA Portable Power Plant. Most productive, most versatile of all screeds. Write for details.

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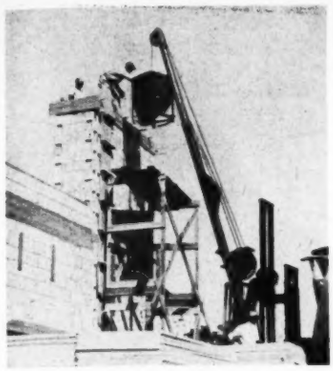
VIBRATORS for every type of concrete construction FOR SALE or RENT at your Jackson Distributor.



The Fitzgerald bucket is designed to place concrete in form openings as small as 2½ inches.

## New Concrete Bucket Pours in Tight Spots

A new concrete bucket, designed to place concrete in form openings as small as 2½ inches, has been developed by Fitzgerald Engineering Co., Inc., P. O. Box 289, Coral Gables, Fla. The shear-gate bucket opening can be varied from 2½ to 8 inches in one direction and to 6 inches in the other. The mouth is designed so that the bucket can discharge against the side of a wall if desired. The company points out that this is of great assistance when pouring concrete into forms against existing walls.

The bucket is currently being manufactured in ⅓, ½, and ¾-yard sizes. It is made of 12-gage all-welded steel and is reinforced with 2 x 2 x ¼-inch angles. The company reports that the smaller bucket can be handled easily with a 2-ton crane; the others with a 3-ton crane.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 319.

## Heavy-Duty Trucks Get New Axle Design

Heavy-duty Federal trucks are being equipped with advanced-design Timken FD-900 and FE-900 Series front axles, according to a report from Federal Motor Truck Co., Detroit 9, Mich. This axle design increases front-end stability, maneuverability, and safety, and reduces maintenance, the company says.

Models 45 through 60 and the corresponding range of six-wheelers—which have a gross vehicle rating from 27,000 to 40,000 pounds—will be manufactured with the FD-900 Series front axle as standard equipment. Trucks with a gross vehicle rating from 33,000 to 60,000 pounds, including the 65 Series and 663MA-664MA tandem units, both gasoline and diesel-powered, will be equipped with the larger-capacity FE-900 front axles.

The axle center for both the FD and FE-900 front axles has an "equalized-I" section of beam between spring pads. This section offers resistance to deflection caused by both horizontal and vertical loads, Federal says. The newly designed steering knuckle spindles are larger and sturdier, and allow minimum deflection. The increased cross section of steering control parts and new "inclined" steering knuckle pin reduce the lift transmitted to the axle center when turning, and make steering easier.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 284.

## Rowe Joins Rubber Bureau

Joseph H. Rowe has joined the technical staff of the Natural Rubber Research Laboratory, Washington, D. C. He will concentrate on rubber-road development work while contributing to the Bureau's general asphalt experiment programs. Before coming to the Bureau, Mr. Rowe specialized in asphalt-concrete research with the Materials Testing Laboratory of the Texas Highway Department.

## Data on Truck Winches

Literature describing many truck-winch models can be obtained from Tulsa Winch, Division of Vickers, Inc., 815 E. First St., Tulsa, Okla. One of the circulars illustrates and describes the entire line manufactured by the company. It also lists all the distributors of Tulsa winches. Separate circulars feature certain models of the Tulsa line. They cover winches for 1½ to 10-ton trucks, which have safe working-load capacities ranging up to 80,000 pounds. Detailed descriptions, specifications, and dimension drawings are provided for each of these models.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 296.

## Protective Coatings

Literature which describes Bitumastic protective coatings is available from Koppers Co., Inc., Koppers Bldg., Pittsburgh 19, Pa. It includes six separate brochures which give the properties, characteristics, and typical uses of six Bitumastic products. In addition to these there is a visual index which indicates the proper coating for a particular job, and an application manual which explains the best method of applying the Koppers coatings.

The visual index and application manual may be obtained from the company or by using the Request Card at page 16. Circle No. 279. A detailed brochure on a particular Bitumastic product may be obtained by indicating the protective service for which it is to be used.

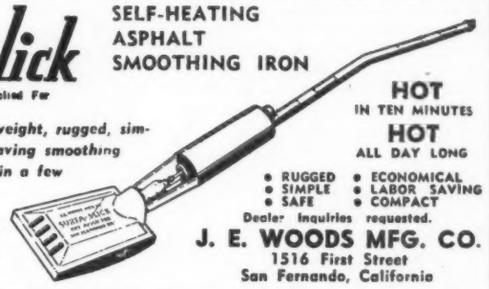

Surfa-slick
Patent Applied For

SELF-HEATING ASPHALT SMOOTHING IRON

HOT IN TEN MINUTES
HOT ALL DAY LONG

Contractors! This lightweight, rugged, simple, time and money saving smoothing iron will pay for itself in a few days use.

No more building and tending fires on your asphalt jobs!



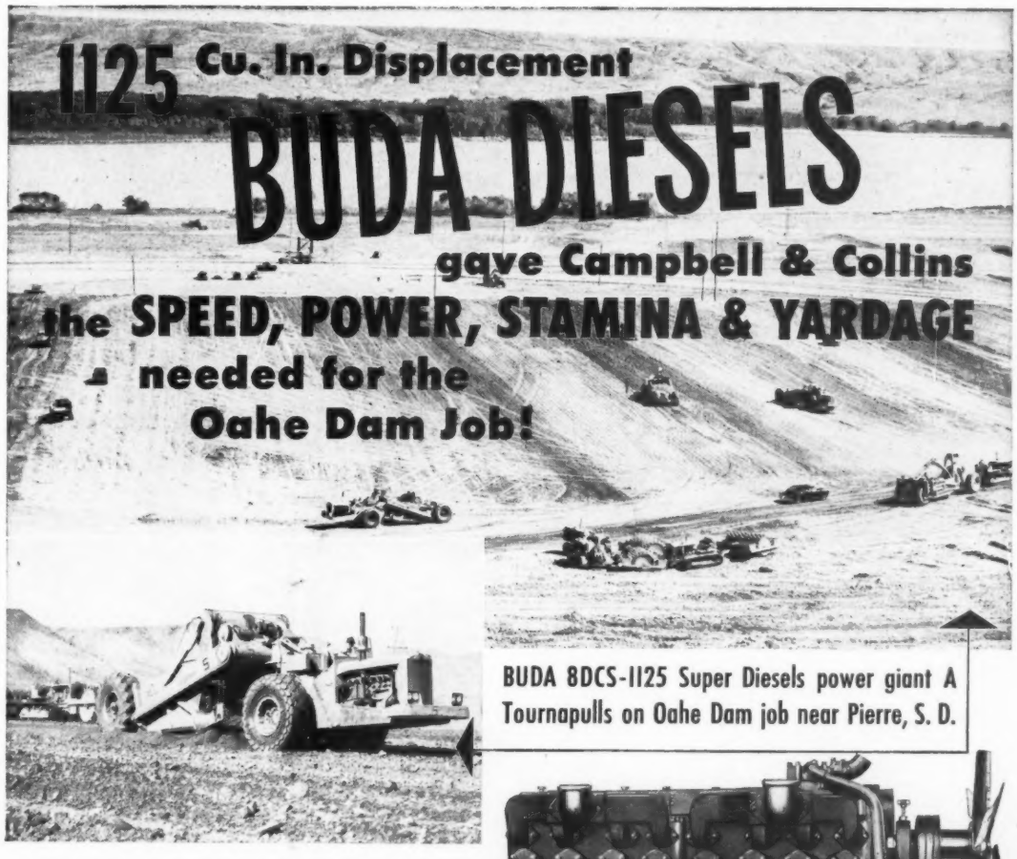
• RUGGED • ECONOMICAL
• SIMPLE • LABOR SAVING
• SAFE • COMPACT

Dealer Inquiries requested.

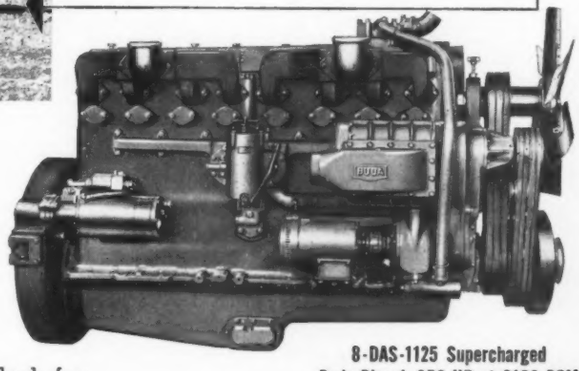
J. E. WOODS MFG. CO.
1516 First Street
San Fernando, California



1125 Cu. In. Displacement
BUDA DIESELS
gave Campbell & Collins
the SPEED, POWER, STAMINA & YARDAGE
needed for the
Oahe Dam Job!



BUDA 8DCS-1125 Super Diesels power giant A Tournapulls on Oahe Dam job near Pierre, S. D.



8-DAS-1125 Supercharged Buda Diesel, 350 HP at 2100 RPM

Contractors like Campbell & Collins, who demand top performance from earthmoving equipment, know from experience that they can depend on Buda Diesels to stand up to tough job conditions, year after year and give low cost, trouble-free operation.

Extra power and greater lugging ability of heavy duty Buda 1125 Super Diesels make them ideal for powering big payoff equipment like A Tournapulls and Carryall Scrapers. Loads on the large Carryalls averaged 21 pay yards; haul cycles ran 1½ miles and the Buda-powered Tournapulls completed a round trip every 13.1 minutes. Performance like that keeps owners sold on Buda Diesels!

See your nearby Buda Distributor today. Ask about money-making, heavy duty dyna-swirl engines for your equipment. Write for Bulletins and specification data. No obligation. The Buda Company, Harvey, Illinois.

a Power-Full and Dependable Name in Engines...

BUDA

BC-14

Manufacturers of Diesel and Gasoline Engines, Maintenance of Way Products, Lifting Jacks, Earth Drills and Material Handling Equipment

## Hammers Improved By Rearranging Parts

Improved Barco gasoline hammers have a new ignition, a greater portability, and an increased operating convenience, says the Barco Mfg. Co., 1818 W. Winnemac Ave., Chicago 40, Ill. Standard models include J-2, weighing 72 pounds, and heavy-duty H-6B, weighing 89 pounds. Both deliver up to 1,550 strokes per minute and differ only in size and weight.

The hammers, which are used for pavement breaking, rock drilling, spading, and tamping, have a simplified arrangement of parts made possible by a compact ignition coil-vibrator-condenser assembly now located in the right hammer handle. This location reduces the length of the high-tension lead from 10 feet to about 5 inches and gives better ignition, the company says. The vibrator, a continuous-vibrating type not dependent on timer point contact, is said to give a fast initial spark and easy starting under all weather conditions. The coil, vibrator, and condenser are of sealed-type construction, and are replaceable as units. The ignition switch, located in the handle, is a new toggle type.

**Redesigned Barco hammers have a new ignition, increased portability, and greater operating convenience.**

The manufacturer recommends a standard 6-volt wet-cell automotive-type battery for use with the hammer, although a 6-volt dry-cell (Hotshot) battery may be substituted. When not in use, the cable from battery to hammer can be disconnected at the handle, leaving the hammer free for carrying, movement, or storage. Barco points out that the hammer requires no auxiliary equipment or power source other than the ignition battery. It is air-cooled and gets its power from a single two-cycle full-floating piston. It uses regular-grade motor gasoline to which lubricating oil is added. Normal fuel consumption is one quart of gasoline per hour, operating continuously, the company says.

Barco offers kits of conversion parts for incorporating these latest features into existing hammers.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 270.

## Data on Diesel Tractor

A broadside describing the DW20 diesel tractor is available from Caterpillar Tractor Co., Peoria 8, Ill. It opens up to a 21 x 33-inch wall chart with a giant cross-section illustration of all component and working parts of the D20. It describes tractor features, performance, safety, and operating methods. Additional data are given on allied scraper and wagon equipment. Detailed specifications are included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 375.

## Blaw-Knox Officials

H. E. Bayer is now General Superintendent of Construction for the Chemical Plants Division of Blaw-Knox Construction Co., Pittsburgh, Pa. Field superintendents in charge of individual construction projects will be under his supervision.

T. D. Harter has been appointed Eastern District Sales Manager of the Clamshell Bucket Department of the Blaw-Knox Division of the Blaw-Knox Co. He will work out of the New York and Philadelphia district offices.


HENRY . . . BUILDERS OF EARTH-MOVING EQUIPMENT

HENRY HYDRAULIC BACKHOES

Speed up and cut costs on every digging job. Easy to operate. Bucket has 7' digging depth . . . maximum reach 11' and swings 60° to either side. Bucket sizes 12", 14", 16" and 18".

HENRY HYDRAULIC SCRAPERS

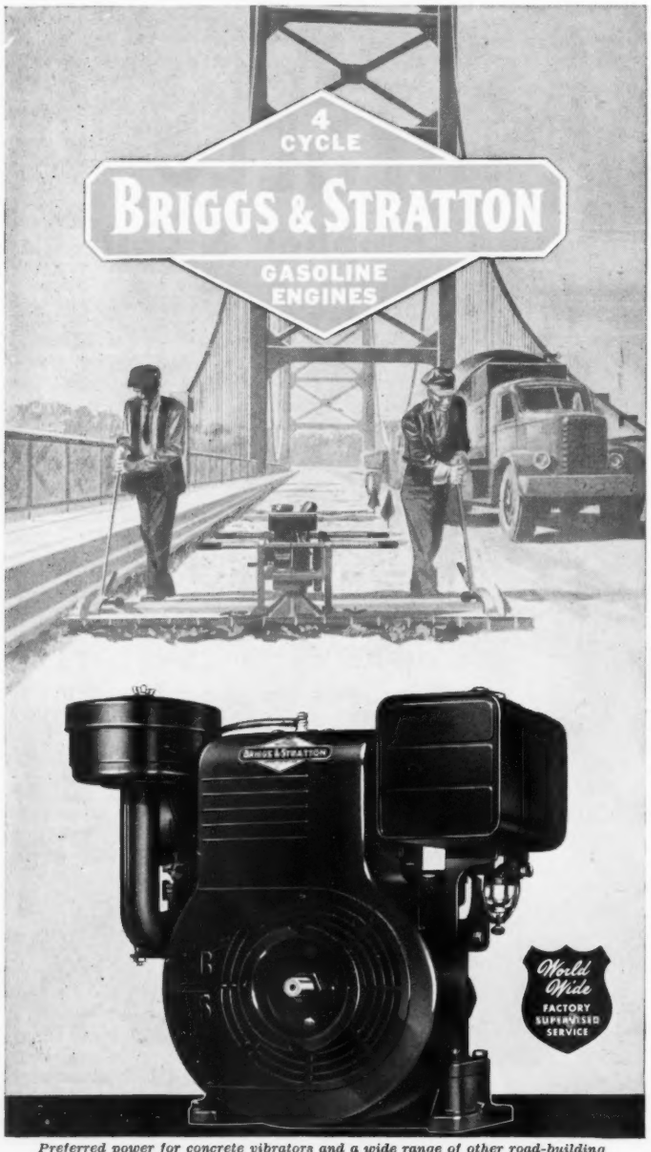
Digs, Hauls, Dumps, Spreads. Saves time and labor. All steel constr. Fully guaranteed. Five models from 1¼ yd. to 6 yd. capacity.

HENRY HYDRAULIC BULLDOZERS

Inside pushbeam permits use of shorter moldboard, giving tractor added reserve power. Henry Dozer DI-84-9 for Int'l. tractor T-9 or TD-9. Henry Dozer DI-84-5 for Allis-Chalmers HD5B tractor.

HENRY Manufacturing Co., Inc.
P.O. BOX 720 — DEPT. CE-651
TOPEKA, KANSAS
Write For Complete Details






*Preferred power for concrete vibrators and a wide range of other road-building and maintenance equipment — the world's most widely used single-cylinder gasoline engines on machines, tools, appliances for industry, construction, railroads, oil fields, and on equipment for farm and home.*

You buy with confidence when machines, tools, and appliances are powered by Briggs & Stratton — the recognized leader in single-cylinder, 4-cycle, air-cooled gasoline engines.

Briggs & Stratton Corporation,
Milwaukee 1, Wis., U. S. A.

In the automotive field Briggs & Stratton is the recognized leader and world's largest producer of locks, keys and related equipment.

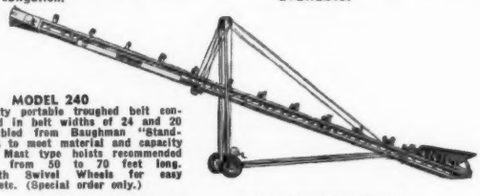
GET THESE "HI-SPEED" FEATURES

- "Standardized" Units usually shipped from stock.
- "Job-Fitted" . . . order assemblies to meet your requirements.
- Set up on the site in a few hours time.
- Bridge-like design—braces welded in correct position for maximum strength.
- Constructed to conform to strictest engineering practices.

AND DEPENDABLE "HI-SPEED" SERVICE

Baughman HI-SPEED Conveying Equipment is the result of practical experienced engineering—proven in operation. It will meet exact requirements, increase output and reduce operating costs. Baughman "Standardized" production methods cut equipment expenses. Quality materials and expert construction minimize maintenance costs. We welcome the opportunity to study your material handling problems . . . there is no obligation.

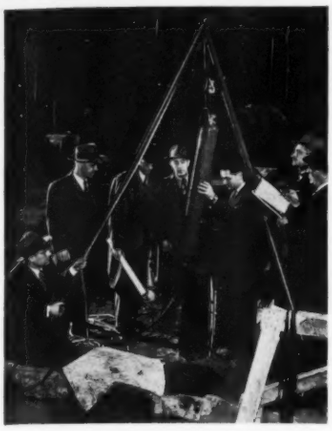
1. Conveniently located distributors from coast to coast.
2. Conveyors shipped in sections for lower freight costs.
3. Standardized construction . . . replacement parts immediately available.



MODEL 240
This heavy-duty portable troughed belt conveyor furnished in belt widths of 24 and 20 inches. Assembled from Baughman "Standardized" units to meet material and capacity requirements. Mast type hoists recommended for conveyors from 50 to 70 feet long. Available with Swivel Wheels for easy maneuvering, etc. (Special order only.)

If It's HI-SPEED . . . It's BAUGHMAN

BAUGHMAN
manufactured by
BAUGHMAN MANUFACTURING CO. Inc
123 ARCH STREET, JERSEYVILLE, ILLINOIS



The metal capsule of Hinchman's electronic plumb bob is lowered into a hollow pile. A small plumb bob inside the capsule is linked with a meter, which will record variations from the vertical made by the bob during its travel down the pile.

## Accuracy of Driving Hollow Piles Checked By Electronic Device

An electronic plumb bob which determines the accuracy of the vertical alignment of hollow piling in place has been developed by The Hinchman Corp., 1208 Francis Palms Bldg., Detroit 1, Mich. It consists of a metal capsule 4 feet long and 5 inches in diameter which is lowered into the hollow piling; an electronic recording device and meter; and a small plumb bob linked electrically with the meter and contained in the capsule. Variations from the vertical made by this bob during its travel down the piling are transmitted directly to the meter. In normal operation, readings are taken at 5 or 10-foot intervals, and provide data for a graph of the piling's course underground.

Since the development of the original plumb bob, illustrated, the Hinchman Corp. has made further improvements. The new smaller instrument requires no tripod or other supporting device for field use, and therefore is more adaptable to work in wet or muddy conditions such as are often found on construction jobs.

The company points out that knowledge of the pile deviation and bearing-point location will make it possible to determine pile loads exactly. They also say that this system should lessen rejection of out-of-plumb piles, since compensating errors in adjacent piles can be determined.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 294.

## Road Protection by Drainage

A folder which cites excessive ground water as the cause of most winter road disintegration and recommends the use of proper subdrainage systems to cure the trouble is available from Armco Drainage & Metal Products, Inc., 703 Curtis St., Middletown, Ohio. Armco perforated pipe, the folder says, will admit harmful ground water without becoming clogged and will drain it away. Photographs illustrate installation of the 20-foot pipe sections. The catalog recommends the use of Armco pipe for highway, railroad, street, airport, and industrial-site drainage systems.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 257.

## Prest-O-Lite Personnel

Curtis W. Young is managing the West Coast Sales Division of Prest-O-Lite Battery Co., Toledo, Ohio. From headquarters in the Oakland, Calif., plant, he has charge of salesmen in the entire west-coast and Rocky Mountain regions. Mr. Young was a district sales representative in the San Francisco area before his promotion.

Howard C. Buck has been appointed District Sales Representative for Prest-O-Lite in the central Rocky Mountain region, with headquarters in Denver.

## Plastic Map Stick

A plastic map stick which simplifies the mounting of and filing of maps, tracings, drawings, and blueprints is made by Ross-Martin Co., 423 E. 4th St., Tulsa, Okla. It is a lightweight all-plastic stick with curved plastic grippers which hold maps by tension. Sheets snap on the sticks without tools, nails, or glue, and they are easily detached.

Maps snap on this lightweight plastic stick made by Ross-Martin Co., and grippers hold them in place.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 348.

## Glass Expansion Joint

A detailed data folder describing Fiberglas expansion joint for concrete work is available from Corrosion Products Division, Owens-Corning Fiberglas Corp., Nicholas Bldg., Toledo 1, Ohio. This product, an asphalt-impregnated bonded-glass-wool board, faced on both sides with heavy asphalt-saturated kraft paper, has been developed to meet the standard specifications for a preformed expansion-joint filler for concrete. The folder supplies data on the functions of an expansion joint and detailed specifications on the Fiberglas product.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 256.


FROM COAST TO COAST more and more contracto depend on LaPLANT-CHOATE MOTOR SCRAPER to complete every job profitably and on schedule

THESE are but a few of the many enterprising contractors who depend on the big profit-making advantages of big-producing earthmovers. *They own LaPlant-Choate Motor Scrapers!* Whether they own single units or fleets, they know they can keep ahead of schedule and make money on every job.

When you choose a TS300 Motor Scraper, you get *more* than an earthmover. You get the ability to haul extra yards each trip, make extra trips per hour. You get LaPlant-Choate *dependability* . . . peak performance day after day . . . low-cost operation and maintenance that reduce earthmoving costs . . . the long, dependable service life that protects your investment.

Ask Motor Scraper owners and operators why they're 100% sold on TS300 advantages. See your LaPlant-Choate distributor for complete details. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa.

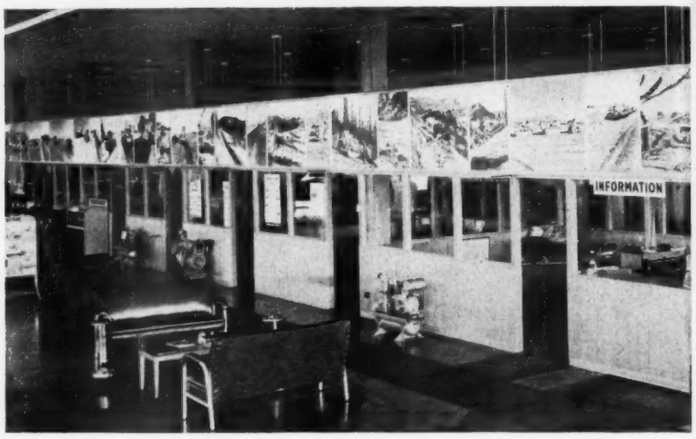
VILLA CONTRACTING CO.
WESTFIELD, NEW JERSEY
This well-known contractor started his contract on t New Jersey Turnpike with ten LaPlant-Choate Mot Scrapers. The line-up of his TS300 fleet is shown belo

LAPLANT CHOATE

Cable-operated Scrapers in 6-, 8- and 14-yd. sizes for all makes of track-type tractors.

2- and 4-yd. Scrapers for track-type and rubber-tired industrial tractors.

Hydraulic and Cable-operated Dozers.




A nice display room and comfortable conference rooms make sales easy for McCoy salesmen and their customers. The parts room (below) is also in the main building of the new plant at East 60th Street and Colorado Boulevard outside Denver.

# Distributor Doings

## The McCoy Co.: Firm With a Future

By RAYMOND P. DAY,
Western Editor

Everything that comes in for repair is steam-cleaned before it passes into the main equipment-repair shop (below).

• AT East 60th Street and Colorado Boulevard, in the new industrial zone just outside the Denver city limits, a new building has been erected. It represents a sizable bet on the future of construction in Colorado. Big signs extol the Caterpillar Tractor Co. and spell out another famous Rocky Mountain name: The McCoy Co.

In the front, on an outdoor display stand, there passes in review an ever-changing panorama of equipment. . . . Santa Claus on a D8, maybe the newest scraper, perhaps a new Thew-Lorain Moto-Crane, or possibly a new concrete mixer. In the 14-acre plot behind the new building sit rows and rows of machines, new and used. They are stacked with a purpose, as we shall see.

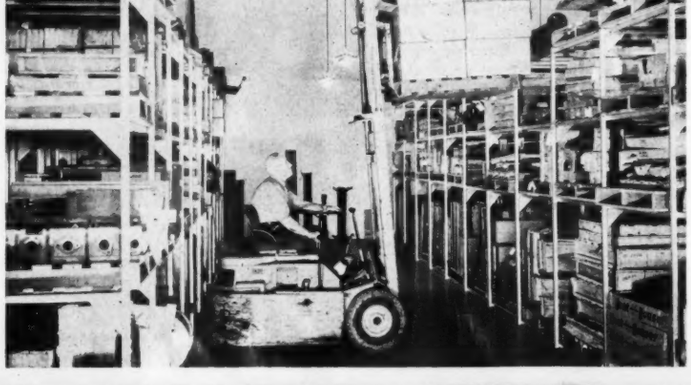
In a comfortable but not over-pretentious back office, any morning shortly after daylight, hang a hat and coat. They belong to Ed Honnen, President and General Manager of the equipment distribution firm. Honnen employs 168 people on his payroll and seldom lets any one of them beat him to work. An ex-contractor, he is big and rangy, polished and profane, highly colorful. He is also a man who loves the state of Colorado, and believes in its future.

"We moved 7,000,000 yards of dirt on soil-conservation work in Colorado last year. Our farmers are getting more and more mechanized. Our contractors built reclamation works as never before. And still the whole damned northwest cor-

(Continued on next page)

Good housekeeping prevails in the parts storage section and everywhere else; Hyster lift trucks (below) handle heavy parts.

McCoy Co. Photos



*McCoy Co. Photo*

**They store and handle cat tracks like this in The McCoy Co. yard.**

*McCoy Co. Photo*

**Here's a special track-assembling rig in the McCoy shops.**

ner of the state has hardly had the grass scratched. Hell's fire!" . . . Honnen has a way of wheeling his chair out from behind his desk when he's talking . . . "anybody can see we haven't done anything yet!"

Business men in the Rocky Mountain empire might possibly disagree with big Ed, because in less than two years the rough ex-contractor has taken the McCoy Co. and set its course dead ahead toward volume business and unequaled service. He's decentralized the sales and service force and set up outlying branches so efficiently that he now can say, "No part of Colorado is more than an hour away from our men".

### McCoy: Famous Name

When Ed Honnen took over the management of the McCoy Co. in 1949, he betrayed a halfway sentimental streak by retaining a famous and traditional name in the equipment distribution business.

It was back in 1929 that F. W. McCoy, a graduate of Colorado University, started the business and called it the F. W. McCoy Co. Later it became Held-McCoy Co., and then again reverted to its original status. Through the years, McCoy built the business from scratch to a real sales and service institution, emphasizing particularly his service to contractors.

On April 19, 1949, F. W. McCoy crashed his private airplane on a Rocky Mountain slope. The years of hard work and effort were over, and from that point it was up to Honnen.

Ed Honnen, a man born and raised in a construction-camp atmosphere, had been a successful contractor in his own right since 1919. Briefly, from 1942 to V-J Day, he commanded the 96th Seabee Battalion and the 51st Regiment in the Azores, France, Africa, the Philippines. CONTRACTORS AND ENGINEERS MONTHLY visited him in 1948, when he was busy supervising and building Granby Dam. When McCoy's plane crashed, Honnen made one of the tough decisions of his life and decided, for better or worse, that he was in the equipment distribution business.

### Never a Dull Moment Since

What happened since is exactly what a fiction writer might plot if he had

(*Continued on next page*)


**A. C. CURRENT ANYWHERE WITH KATOLIGHT**

**Lighting Plants from 350 watts to 25 KW., generate standard 60 cycle A.C. current, same as the High Line. A.C. Generators from 300 W. to 300 Kilowatts. Speeds of 720, 900, 1200 & 1800 RPM. Rotary Converters, single phase & three phase A.C. Motors. Write today or see your auto parts Jobber or Equipment dealer.**

**KATO ENGINEERING COMPANY**
**118 Maxfield Avenue**
**Mankato Minnesota U.S.A.**

**Give Generously to the Red Cross**

**WHEREVER CONCRETE MEETS CONCRETE . . . ASSURE**

# Smooth, trouble-free joints

**WITH FLEXCELL** REG. U. S. PAT. OFF.

**BITUMINOUS FIBRE EXPANSION JOINT FILLER**

Arroyo Seco Highway, Los Angeles, California. Durable, resilient expansion joints assured by Flexcell Joint Filler.

San Francisco-Oakland Bay Bridge, San Francisco, California. Joints are neat and trouble-free, thanks to Flexcell Joint Filler.

Detroit Express Highway, Detroit, Michigan. Flexcell Joint Filler keeps expansion joints smooth, tight, safe.

For tight, durable, maintenance-free expansion joints between concrete slabs—leading engineers and architects have long specified Flexcell* Joint Filler! No bulges, no gaping crevices! Flexcell absorbs compression without extruding . . . expands on release of pressure to fill joint. Low in first cost, it gives continuing savings on maintenance. Withstands severest service, extremes of heat and cold. Superiority proved in years of performance on hundreds of America's most famous highways, bridges and airport runways!

**Another CELOTEX Product** REG. U. S. PAT. OFF.

***FLEXCELL** is the Trade Mark identifying Bituminous Fibre Expansion Joint Filler marketed by The Celotex Corporation.

THE CELOTEX CORPORATION • 120 S. LA SALLE STREET
CHICAGO 3, ILLINOIS

***Only Flexcell gives all these big advantages***

1. **NON-EXTRUDING**—Millions of tiny air cells in Flexcell Joint Filler permit compression *without extrusion*. Rough-textured surface bonds more firmly with concrete.
2. **KEEPS JOINTS TIGHT**—On release of pressure Flexcell Joint Filler re-expands to fill joints.
3. **MOISTURE-RESISTANT**—Flexcell Joint Filler's base of durable Celotex Cane Fibre Board is impregnated with a special asphaltic compound for lasting protection against moisture.
4. **TOUGH, DURABLE**—Long life and economy proved by years of service on hundreds of famous projects!
5. **EASY TO WORK WITH**—Flexcell Joint Filler is light, easy to install. Gives neat, finished joints with no trimming. Outstanding for work involving special cutting, tapering and fabricating.
6. **ONLY FLEXCELL**—of all expansion joint fillers, is made of long, remarkably strong Louisiana cane fibres—and protected by the exclusive (patented) Ferox® Process against fungus, dry rot, termites.

**MAIL THIS COUPON TODAY**

**The Celotex Corporation, Dept. CEM-71**
**120 S. LaSalle St., Chicago 3, Illinois**
Without obligation, please send me complete specifications and prices on Flexcell Bituminous Fibre Expansion Joint Filler.

**Name** _____

**Address** _____

**City** _____ **Zone** _____ **State** _____

## Distributor Doings

(Continued from preceding page)

enough imagination. All the ingredients for drama were there. Into a dignified, solid business setting came a man who all his life had persuaded, driven, begged, and wheedled men to do his bidding. What would happen when the big contractor started dealing with customers?

If anyone doubted or wondered, they didn't have long to wait, because Honnen started in as if he were building a 10-mile road job and had to get it done by Saturday night.

Contractor business was fine, sure, but how about farmers, officials of cities and counties and the state highway department; how about sales possibilities on soil-conservation work? One of Honnen's first decisions was an order to his sales force to focus red-hot sales effort on these groups, and to maintain the good sales relations with contractors, most of whom Honnen knew personally.

He had the state franchise for Caterpillar, Thew-Lorain, Smith truck mixers, CMC mixers, Gardner-Denver, Esco, Leschen . . . and a host of smaller accounts. He had men like Red Watson, Shop Superintendent, who had known and endured and respected Honnen's organizational ability for 20 years. Paul Austgen, formerly of the big accounting firm of Ernst & Ernst, was Comptroller. George Goodwin was Service Manager . . . Zeke Tressler, Parts Manager . . . Jack Finchan, Sales Manager . . . men who had learned their jobs well, long before this appointment.

Sales results were immediate, and business continued to climb. Honnen quickly made a decision. Branch offices existed at Sterling, Grand Junction, Monte Vista. To Glenwood Springs, Delta, Durango, Greeley, Steamboat Springs, Pueblo, and Lamar went teams of salesmen and service men. Farmers and county officials were soon getting their rigs serviced in less than an hour. They liked it, and many have told Honnen they appreciate it. Honnen's reaction is a scowl, for all he did was consider the problem from their veiwpoint and invest a little money to get the right solution, and he believes people ought to see it for themselves and let it go at that.

He then took the company out of Denver and set it up again on a 14-acre tract he had purchased outside the city limits near the dog track. In the racing season these days everybody in Denver, practically, passes the showplace he designed and built. It is a layout that would be the envy of any salesman, any distributor, any nut-busting mechanic in the country, regardless of where he might be.

The main building, a single-story concrete-block and brick affair, has 65,000 square feet of floor space. It has acoustic ceilings, radiant floor heat, fluorescent lighting, comfortable customer-conference rooms, roomy offices.

Every lesson Honnen had ever learned in the contracting business was used in the design of his main equipment-repair shop. The shop was designed with 10 working bays, with separate roomy doors for each bay. On the sound theory that a crane is as vital to efficient heavy-equipment repair as a wrench, individual overhead cranes went into each bay. They can move a D8 through the doors, for example, and have its engine pulled and transported over to an engine stand in a very short time.

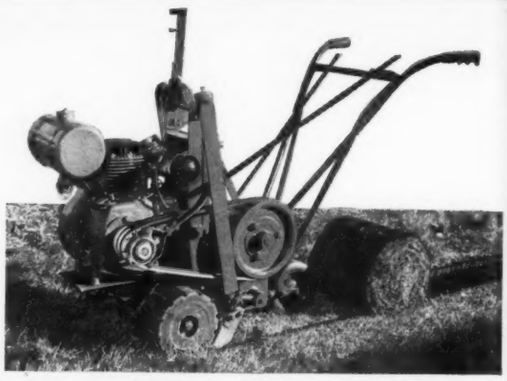
Adjacent to the heavy-repair shop is the welding and fabricating room. Much of the McCoy Co. business consists of building custom gadgets for contractors, special equipment for the Government, and McCoy sheepsfoot rollers. Steel plate and other fabricating stock is stored outside this shop, but it is all accessible to the 15-ton Shepard-Niles overhead crane which serves this division. Even on cold winter days when the crane has to travel outside, the radiant floor heat keeps the shop warm. Electric welding in the fabricating shop is made much easier than usual by the installation of an arc welder every 20 feet along both sides of the shop. There is no lost time as men work. A welder is handy. Automatic acetylene cutting and welding machines are also available in the fabricating shop.

The new layout also includes a paint shop, sandblasting shop, and of course the parts room in the main building. It is a model of orderly arrangement, and it stays that way, because one of Honnen's pet aversions is sloppiness and poor housekeeping. Let someone drop something where it doesn't belong, and Honnen can spot it as far as he can see.

(Continued on next page)


**SAVES**
**Up to 80% of labor costs**

**ONE MAN**
**cuts 600 sq. yds. of sod per hour**



**THE RYAN POWER SOD CUTTER**

**solves the sod lifting problems of the modern landscaping contractor. Ruggedly constructed to give many hours of trouble-free service.**

*Write for folder.*

**K & N MACHINE WORKS, INC.** 871 Edgerton St. St. Paul, Minn.



# B.F.Goodrich

## These tires give less trouble —more recaps!

THE ARISS-KNAPP COMPANY of Oakland, California, is engaged in excavating and hauling dirt, rock and gravel in the San Francisco Bay area. They operate 5 semi-dump trucks, 9 regular dump trucks, 2 motor graders and 1 tractor-low-bed trailer. Hauling heavy loads over dirt, gravel, rock and a mixture of all types of roads, the drive wheels of these trucks are all equipped with B. F. Goodrich tires.

Grading contractors operate in all kinds of weather. When dirt surfaces are wet, traction is especially important. Ariss-Knapp has found that the BFG Universal tread offers extra safety. J. A. Wagnon, one of the drivers, says that he likes the way these tires grip and describes them as "really terrific" on all types of driving surfaces.

Then, too, the patented B. F. Goodrich *nylon shock shield* gives added safety . . . added miles. These strong, elastic nylon cords between the tread rubber and the cord body absorb and distribute shocks evenly. It's an exclusive BFG feature that's provided at no extra cost in all tires of 8 or more plies.

Contractors everywhere have found that B. F. Goodrich tires give maximum performance in all operations. They've found that they have fewer road delays and can recap more often. For any on or off-the-road service where extra traction and bruise resistance is necessary, see your local BFG dealer—or write for information. *The B. F. Goodrich Company, Akron, Ohio.*

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

*C.&E.M. and McCoy Co. Photos*

**In Ed Honnen's unpretentious back office are, left to right, Service Manager George Goodwin, Shop Superintendent Red Watson, and President Ed Honnen. At right are some of the McCoy employees in the mess hall, getting a demonstration and lecture.**

And he sees a considerable bit, because his hat and coat are the only part of him that stays in the front office, remember?

Practically all parts too heavy for a man to handle are stored in bins on timber pallets, and two Hyster front-end lifts move them around as necessary. Every part and every bin is carefully cataloged on a Kardex filing system, and a vacuum-tube system connects the files with the parts room. When a customer comes in with an order, it is immediately whisked away to the office. Back comes the bin number. While the parts-room men dig out the parts and place them on a delivery platform, other office machinery completes the paper work and the customer is soon on his way.

### Assembly-Line Repair

Fast, thorough, orderly repair of used equipment comprises a big portion of shop work. It is arranged on a systematic basis. Used equipment up for repair is stored on one line out in the yard. It passes first through the steam-cleaning room, where the machine is thoroughly cleaned by hot steam and solvents. Then it goes into the repair shop, where it is dismantled and the repairs made. Three bays are currently set aside for the reconditioning of Government equipment, by contract. If it is necessary, the assemblies are sandblasted before they are again put together. After the repairs are complete, the machine goes either to the steam-cleaning room, the sandblasting shed, or both. It is then repainted.

New equipment coming in for sale is stored on still another line, and it moves through the shop in an orderly fashion. Everything in the way of preliminary service, lubrication, and so on is done. If the machine is sold and scheduled for delivery, the customer's name is painted on, if he so desires.

*(Continued on next page)*


**M-SCOPE**

Pipe Locator

MODEL AB

ONE-MAN OPERATION

METAL CASED CABINETS

HEAVY DUTY PERFORMANCE

ONLY $149.50

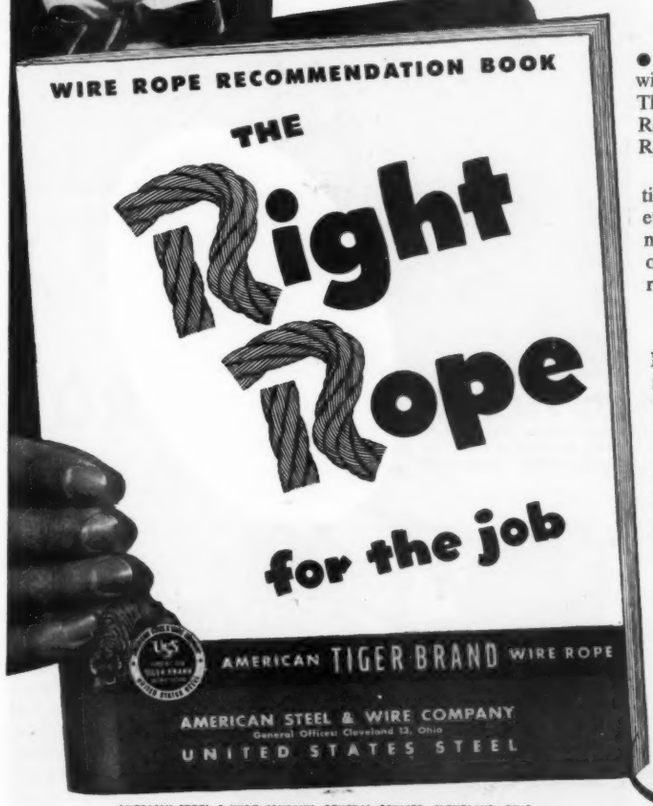
FREE LITERATURE

FISHER RESEARCH LAB., Inc.

Palo Alto California

**This New Book can save plenty of money for YOU!**

IT SHOWS YOU HOW TO BE A BETTER BUYER OF WIRE ROPE




● Here is a book that every user of wire rope should have in his file—The American Tiger Brand Wire Rope Recommendation Book, "The Right Rope for the Job."

It covers all industries—construction, mining, petroleum, marine—even aircraft control cable. There are numerous photographs, plus listings of equipment and the types of wire rope that should be used.

**For Special Applications**

Naturally, there will be applications not covered in the book. For these we maintain a staff of Tiger Brand Wire Rope Specialists — engineers who can help you select the wire rope which will fit your particular needs. These men are constantly working with users of Tiger Brand Rope . . . saving them money and eliminating trouble by properly specifying wire rope.

***Don't pass up this opportunity***

***Send for FREE BOOKLET . . . Now.***

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

**AMERICAN TIGER BRAND WIRE ROPE**

USS

*Excellay Preformed*

American Steel & Wire Company
842 Rockefeller Building, Dept. O-7
Cleveland 13, Ohio

Please send me your Recommendation Booklet, "The Right Rope for the Job."

Name..... Position.....

Company.....

Address.....

City..... Zone..... State.....

UNITED STATES STEEL

## Distributor Doings

*(Continued from preceding page)*

Used equipment, taken in on trades, moves generally through the same process as equipment up for major repair. Honnen doesn't like to sell a piece of equipment "as is". He'd rather see it go out in brand-new shape, because nobody knows better than he what a superintendent or engineer is up against in the field, and how dependable his equipment should be.

If there are parts emergencies, the heavy-repair shop under Red Watson's supervision is equipped to make things. The shop has three big lathes. Such things as bearings and shafts for McCoy rollers are turned from these lathes constantly. For quite some time, the fabricating shop was authorized by Caterpillar Tractor Co. to manufacture bulldozers to the parent-company plans. That work has now been discontinued with the resumption of production at Quincy, Ill.

### Mechanical Instructions Given

One of the best public services the McCoy Co. is now giving is a series of mechanical-instruction lectures in the operation, design, performance, and service of various kinds of equipment. At Camp Carson, for example, an engineer unit of the Army is in training. Sample equipment is limited . . . one group learning to use motor graders had only an obsolete pull-type grader to study. Ed Honnen brings group after group in to the McCoy Co., and key men teach the recruits everything they can. Operators from the counties, cities, and the State Highway Maintenance Department frequently go in for instruction. A cutaway model of the engine in a Caterpillar No. 12 motor grader is on display in the front of the showroom, and it has been invaluable in the lectures.

Another feature which pays off in instruction, morale, and general efficiency is a company-run kitchen and dining room, which operates on a nonprofit basis. Students, visiting customers, and the entire force meet during the lunch hour. Frequently some kind of educational movie is run. They are currently far enough along in one on economics that everybody is interested. At least once every two to three months the whole state-wide force gets together for a sales meeting and a dinner.

And sales are steadily mounting. The service McCoy Co. is now rendering to the state of Colorado is enormous. Where it will stop, if it ever does, is anybody's guess. Honnen himself is convinced that Colorado is years away from any possible saturation of construction volume, and that the construction of all types of work will increase for many years to come. Mining, agriculture, forestry, soil conservation, reclamation, flood control, and highway work are far from finished, he believes.

Quite often he and Del Stout, his combination advertising manager and airplane pilot, get out over the state. According to Stout, it is uncanny how much of Colorado Honnen has seen first-hand.

"A few weeks back we were flying to Grand Junction", Stout related. "There was stormy weather on the direct route, so Ed and I went down south and made an approach up the Gunnison River valley.

"We got over Blue Mesa, and hit a howling storm. Under any other condition I'd have turned around, set down at Gunnison, and waited it out. Not with Ed along, though. He said he'd worked through all of that country, and knew every foot. He did, too. He'd point out some curve on a back road down below us and say 'I backed a truck off of that fill 25 years ago'. He bird-dogged every landmark and soon we were clear of the storm on the other side, and we flew on to Grand Junction. I wouldn't even think of doing such a thing without him along."

Today, Ed Honnen continues to run his state-wide organization exactly as he ran a construction spread in the old days. He's the first man to work and the last to leave. He goes out and sees for himself what's going on. He views the construction business and even the world situation optimistically. And he continues his inflexible brand of driving . . . it is really an old-fashioned enthusiasm for work. Himself he drives hardest of all.

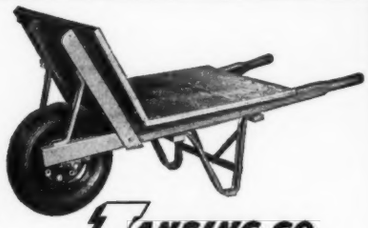
### Party Introduces Hoist and Tower

The evening of May 11 was a full one for Equipment Corp. of America, Chicago, when the Mason Contractors' Association of Cook County held its general meeting at the company's plant.

*(Continued on next page)*


**LANSING BRICK & TILE WHEELBARROW**

The Lansing J15-A, an improved model of a wheelbarrow that has been a favorite for years, is rugged and dependable. Designed balance places most of the load on wheel. Ask your dealer, or write factory or one of our warehouses for details.

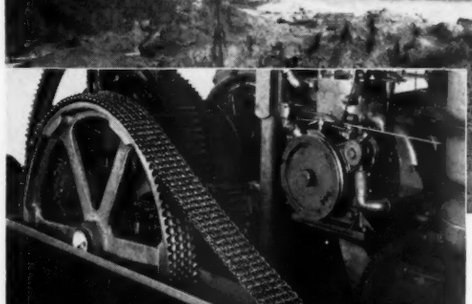


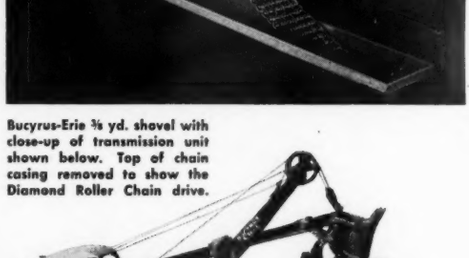
LANSING CO.
LANCO MATERIAL HANDLING EQUIPMENT
LANSING, MICHIGAN

Chicago, Ill., 1535-1537 S. State Street
Kansas City, Mo., 1413-1415 W. 11th Street
Philadelphia, Pa., Cor. N. American & Willow
Minneapolis, Minn., 326 N. First Street
San Francisco, Calif., 338-348 Brannon Street
Boston, Mass., 78 Cambridge Street
New York, N. Y., 28-30 Vandam Street

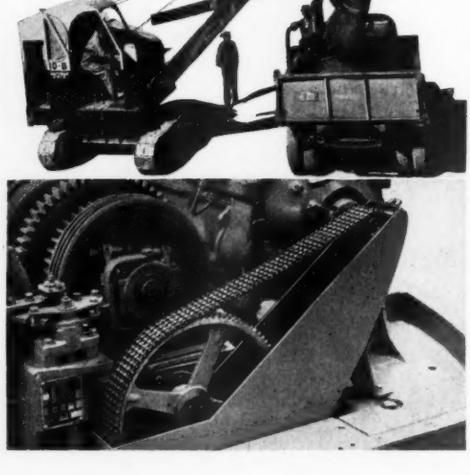
**FOR EXCAVATORS OF ALL CAPACITIES**

The 2½ yd. dragline shown is Bucyrus-Erie 54-B. Below is shown 4-strand Diamond Roller Chain driving transmission unit and boom hoist machinery.





Bucyrus-Erie ⅜ yd. shovel with close-up of transmission unit shown below. Top of chain casing removed to show the Diamond Roller Chain drive.



**Widely Known DIAMOND ROLLER CHAINS Provide Sure and Lasting Power Transfer**

● Now the importance of using *well known* and proven equipment and parts is more vital than ever.

Diamond Roller Chains have been proven through all the years of modern earth handling equipment—on every kind of job—in all parts of the world.

Longer useful life and greater reserve strength mean fewer delays and more continuous yardage. That this is widely acknowledged by top machinery engineers and successful contractors, both large and small, is evidenced by the constantly increasing use of Diamond Roller Chains. Precision-made to higher quality standards, Diamond will serve you most economically.

**DIAMOND CHAIN COMPANY, Inc.**
Dept. 487, 402 Kentucky Avenue, Indianapolis 7, Indiana
*Offices and Distributors in All Principal Cities*
Refer to the classified section of your local telephone directory under the heading CHAINS or CHAINS-ROLLER

DIAMOND ROLLER CHAINS

**PAINTS OVER RUST!**
**RUSTREM STOPS RUST!**
**No priming, scraping, brushing**

Rustrem paints right over rust. For stacks, fire escapes, bridges, fences, flashings...all metal. Farm, auto, marine, machinery. Black, aluminum, clear.

SPECO, Inc. 7308 Associate Ave. Cleveland 9, Ohio

Star performers at the Equipment Corp. of America party were these bagpiper cadets from Northwestern Military and Naval Academy, Lake Geneva, Wis. No. 1 in the second row is Stanley Rowland, son of Equipment Corp. District Sales Manager J. E. Rowland. Behind the pipers is the Academy Crack Company and Color Guard, which put on an exhibition of precision drilling.

Tractor & Equipment Corp., Ltd., Caterpillar dealer in New Delhi, India, displayed its line of products at the Exhibition and World Power Conference sponsored by the Central Board of Irrigation, Government of India. Among its visitors was Mrs. Indra Gandhi, daughter of Prime Minister Pandit Jawaharal Nehru. Tractor & Equipment Corp. participated on behalf of all Caterpillar dealers in India.

Highlight of the evening program was the performance of the Bagpipe Corps and Drill Team from the Northwestern Military and Naval Academy of Lake Geneva, Wis. Equipment was on display throughout the evening, followed by additional entertainment and a buffet supper.

Equipment Corp. of America rebuilds construction equipment and offers it for sale or rent. In addition, it is factory distributor in Chicago for American Hoist & Derrick Co., Chicago Pneumatic Tool Co., and American Tubular Tower Co. Products of these companies were on display for the Mason Contractors' Association.

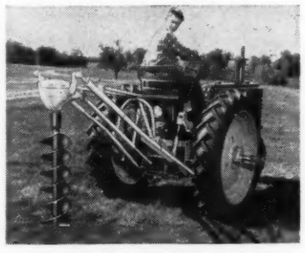
The All American automatic tower and hoist was given its second public showing at the party. Two different manufacturers worked in conjunction to produce the hoist and tower, at the suggestion of the distributor company. American Hoist & Derrick Co. designed the hoist for automatic operation; American Tubular Tower Co. designed the tower for easy and quick erection. Together the hoist and tower form an automatic material-handling device by which the movement of cages is cable-controlled by a workman on the ground or at any level of the building under construction. The rig had its first showing late in 1950. This was the second showing for Chicago contractors.

### A Bedtime Story by a Distributor

City Industrial Engine Sales, Inc., 2259 S. Indiana Ave., Chicago, Ill., distributed a booklet called "Bedtime Story" at the Materials Handling Exposition. Subtitled "Industrial Engines, Horsepower, Horse Sense, and Hortense", this 16-page cartoon-illustrated booklet tells of the adventures of Hortense and her husband, Tom, in their struggle to get Tom's boss to buy some

*(Continued on next page)*


# DIG HOLES
## SITTING DOWN



***ONE-MAN OPERATION***

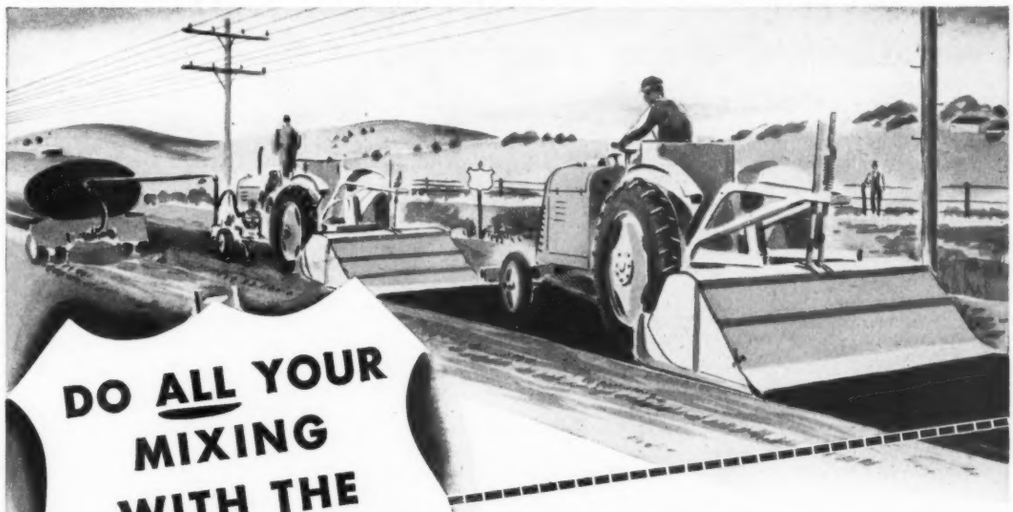
The Danuser Digger is easily installed on most popular makes of tractors—augers from 4" to 24" available in eight sizes. Quality built—rugged construction throughout. Literature showing application to your particular tractor available, write

DANUSER MACHINE CO.
537-41 E. THIRD ST., FULTON, MO.

DANUSER DIGGER

Tested and approved by most tractor manufacturers.





# DO ALL YOUR MIXING WITH THE SEAMAN

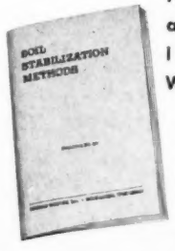
ROAD MIXING with the SEAMAN is the quick, low cost, efficient method. The SEAMAN is engineered and built specifically for that job — just as blades, for example, are built for grading, shoulder work and general maintenance.

The SEAMAN MIXER is designed to mix completely to the bottom of the full selected depth. No unmixed material at the subgrade — and no subgrade material brought up into the mix. Depth control is accurate and positive under all conditions.

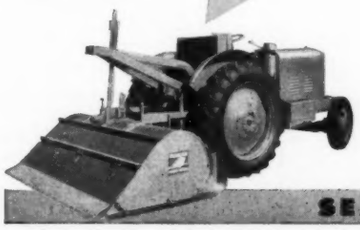
And you have complete command of the mix itself at all times. No worries about an unsatisfactory operation even when conditions are adverse, for with the SEAMAN an additional pass to bring the mix up to specification is done quickly and at low cost.

It pays to use the equipment which has been *designed* for its particular job. That's why more and more contractors and highway officials insist that *all* mixing be done with the SEAMAN.

**The new, 1951 edition of "Soil Stabilization Methods" is off the press. Completely revised and enlarged, 100 pages of pictures, diagrams and practical construction information. It's FREE. Just ask for Bulletin 25. Write today.**



The SEAMAN Self-Propelled (left) is a complete mixing unit which offers full 360 degree operator visibility and accurate control of the mix. It also frees a critical tractor for other work . . .



The SEAMAN TRAV-L-PLANT (right) offers all the advantages of the Self-Propelled unit. It is equipped with tachometer assembly and a volumetric meter is available for the closely controlled application of bitumen. Water also is readily applied.

SEAMAN MOTORS, INC.
282 N. 25th ST.
MILWAUKEE 3, WIS.

# Distributor Doings

(Continued from preceding page)

new equipment so Tom won't have to spend so much time making-do. Copies are available from the company.

### Two Dealers for Thew Shovel

O'Neil Equipment Co., Muskegon Heights, Mich., is handling Lorain power shovels and cranes for The Thew Shovel Co., Lorain, Ohio, in the western half of the lower Michigan peninsula including the counties of Emmet, Charlevoix, Antrim, Kalkaska, Missaukee, Osceola, Mecosta, Montcalm, Ionia, Eaton, Calhoun, and Branch.

Dalrymple Equipment Co. of Memphis, Memphis, Tenn., handles the Lorain line in western Tennessee, northern Mississippi, and in six Arkansas countries.

Left to right: Mr. and Mrs. A. I. Savin, Ture Holmes, and Bernie Holmes photographed at the recent all-day open house and 25th-birthday party of the Holmes-Talcott Co.

### Holmes-Talcott Celebrates

Some 1,500 people wished Holmes-Talcott Co. "happy birthday" recently at an open house to celebrate the company's 25th anniversary. During the day, representatives of 27 manufacturers demonstrated equipment, answered questions, and helped Holmes-Talcott officials with the entertaining.

It was in 1926 that the distributor firm was organized in Springfield, Mass. It was incorporated in 1929 and a branch was established in East Hartford, Conn. Then in 1929 Ture B. Holmes acquired the controlling interest and became the company's president. In the same year, the main office was moved to East Hartford and Springfield became the branch. Seven years later, the first section of the present plant at 599 Franklin Ave., Hartford, was constructed, and in 1941 the Springfield branch was closed.

From that start, operations have expanded into three companies. The Holmes-Talcott Co. continues to deal in road builders' and contractors' equipment. The Hartford Rental Sales Corp. provides equipment on a rental basis. And The Holmes Equipment Co. serves the equipment needs of Connecticut. The companies cover all of Connecticut, four counties in western Massachusetts, and Vermont.

Here are some of the company's accounts: Allis-Chalmers, Chain Belt, Michigan Crane & Shovel, Ross Carrier, Iowa Mfg., Gar Wood, Joy, Littleford Bros., Mack Motors, Manitowoc Engineering, Erie Steel, Baker Mfg., and Oshkosh Motor Truck.

The firm keeps eight sales engineers in the field to serve Connecticut. It recognizes that a sale is only the beginning of the relationship with the customer. The service department follows up each unit to assure proper operation and maintenance. Training schools are held for customers' operators and shop men.

This year is the 25th of such service.

### More Dealers for Gar-Bro

The Gar-Bro Mfg. Co., Los Angeles, Calif., has added several dealers to its list this season and given additional territory to one or two others. These dealers are handling the Gar-Bro line of Power - Carts, concrete - placing equipment, material-handling trucks, cement-storage units, and wheelbarrows.

Edward C. Flaherty Co., Long Island City, N. Y., has an exclusive distributorship in the thirteen counties adjoining Long Island. Wm. F. Surgi Equipment Co., New Orleans, La., handles the Gar-Bro line in the southern counties of Louisiana and Mississippi. Conley-Lott-Nichols, Lubbock, Texas, is the dealer for the Texas counties of Lubbock, Midland, and Abilene. The counties adjoining El Paso in Texas and the southern counties of New Mexico are the territory of Contractors Equipment & Supply Co., El Paso. Lyons Machinery Co., Little Rock, Ark., has ex-

(Continued on next page)


## "new standard" Jaeger Compressors

15% to 25% more air —
30% to 40% more work
Model 125 runs 2 heavy breakers at full pressure instead of weak 70 lbs. You can break pavement at least ⅓ faster than with any 105 ft. unit.
Same men, same tools do 4 days' work in 3
Model 250 will keep a 3½" wagon drill hitting hard and fast enough to average 35% more footage than you can drill with 210 ft. of air. Other sizes, 75 to 600 ft., offer comparable advantages.

Why starve your modern air tools with "old standard" compressors that have not increased their air output in 19 years? Jaeger Air-Plus standards provide the increased air you need to power today's tools at their full efficiency—*at the lowest cost per foot of air of any compressors on the market.*

*See your Jaeger distributor or send for complete Catalog*

**THE JAEGER MACHINE COMPANY**

**701 Dublin Ave., Columbus 16, Ohio**

PUMPS • MIXERS • HOISTS • TRUCK MIXERS • PAVING MACHINERY



**THE ANSWER TO THE ENGINEER'S PRAYER**

BREAKS CONCRETE FASTER

TAMPS BACKFILL BETTER AND FASTER FOR LESS

**THE NEW, MORE POWERFUL**

**MIGHTY "B" MIDGET**

Fastest Pneumatic Concrete Breaker and Backfill Tamper. Replaces all the dirt removed after pipe has been laid.
Gives you high density compaction. Ready to repave immediately. No temporary paving. No spoil dirt to haul away. Due to high density compaction, requires little asphalt in replacement. Cuts cost of tamping and breaking of concrete many times. Can be worked manually or automatically. 160' Compressor for full capacity or 105' Compressor for ½ capacity.
For further particulars, see your nearest dealer, or write Department C.

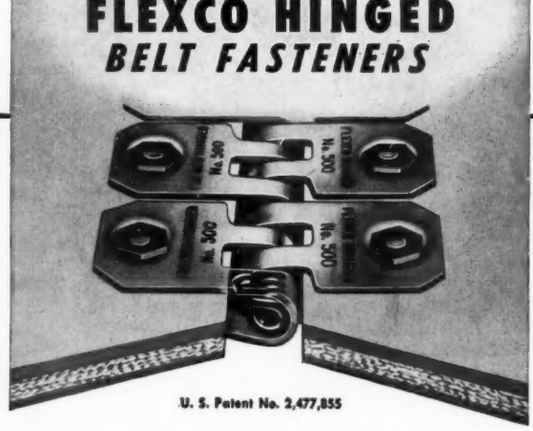
**R. P. B. CORPORATION**

**2751 East 11th Street Los Angeles 23, California**



*... the new separable*

**FLEXCO HINGED BELT FASTENERS**




U. S. Patent No. 2,477,855

- For joining grader, trencher, ditcher and other earth moving conveyor belts.
- For belts ⅜" to ½" thick.
- A FLEXCO fastener that is HINGED. Has removable hinge pin.
- Troughs naturally, operates through take-up pulleys.
- Strong, durable . . . pull or tension is distributed uniformly across joint.

*Order From Your Supply House. Ask for Bulletin HF 500.*

**FLEXIBLE STEEL LACING CO.** 4668 Lexington St., Chicago 44, Ill.

# Distributor Doings

(Continued from preceding page)

clusive rights in that state. Hall-Perry Machinery Co., Butte, Mont., is in charge of the sale of Gar-Bro equipment in Montana and ten northern counties in Wyoming. A. H. Cox & Co., Seattle, Wash., has been given the counties of Okanogan, Grant, and Douglas in addition to the Seattle territory which it has handled since 1942. Purves E. Ritchie & Son, Ltd., Vancouver, is taking care of the Province of British Columbia, Canada, and the Laurentide Equipment Co., Ltd., Montreal, is the dealer for the Province of Quebec and for the Ottawa Valley, Canada.

### Twenty-Five Years for Fabick

Twenty-five years ago this year, John Fabick, Sr., established an equipment-distributing firm in St. Louis and adopted the motto "the best in service for the best in equipment". Today his sons John, Jr., Francis, and Joe, are carrying on the business of John Fabick Tractor Co. as President and General Manager, Secretary and General Sales Manager, and Vice President and Treasurer respectively.

To thank them for service rendered and wish them well in the future, several manufacturers took full-page ads in the April issue of *Mississippi Valley Contractor*. Caterpillar, Thew Shovel, Trackson, Athey, Hyster, Ulrich Products Corp., Joy, Pioneer, Preco, Buffalo-Springfield, Rome Plow, Bethlehem, Hendrix, Towner Mfg., and H & L Tooth Co. were among the well-wishers on the occasion of this silver anniversary.

### Five Dealers for Joy

Joy Mfg. Co., Pittsburgh, Pa., has appointed five dealers for its line of construction equipment which includes portable air compressors, wagon drills, hand-held rock drills, paving breakers, spaders, tampers, and portable hoists. The Missouri Valley Machinery Co., Omaha, Nebr., is exclusive distributor for an area covering 28 counties of northeastern Nebraska and 23 counties of eastern Iowa. Halsey-Reid Equipment, Inc., Buffalo, N. Y., handles the Joy line in a 7-county area surrounding Buffalo, from its new quarters on Harlem Road. G. W. Clements Equipment Co., Columbus, Ohio, is an authorized distributor for Joy equipment including exploratory diamond-core drills. The other new dealers are Davis-Hancock Machinery Co., of Dallas, Texas, and Paving Supply & Equipment Co. of Washington, D. C., and Baltimore and Salisbury, Md.

### Cleco Dealers

Sigurd Stave, Kengensgate 10, Oslo, Norway, is handling the air tools and accessories made by The Cleco Division of the Reed Roller Bit Co., Houston, Texas.

The House of Pfaff, Inc., Long Island City, N. Y., is distributing the complete Cleco line in that area.

### Straub Dealer in Spokane

The Straub Mfg. Co., Inc., Oakland, Calif., has appointed Construction Equipment Co., Spokane, Wash., as its exclusive eastern-Washington representative for Kue-Ken crushers.

### O'Connell for Detroit Diesel

O'Connell Brothers, Inc., Phoenix, Ariz., is handling Arizona sales of diesel engines for the Detroit Diesel Engine Division of General Motors Corp. The dealer firm is planning to expand its present headquarters and to establish outlets in Flagstaff, Safford, and Tucson.

### Three Outlets for Woods

The J. E. Woods Mfg. Co., San Fernando, Calif., has three new outlets for Surfa-slick, a self-heating asphalt-smoothing iron. Frank D. Messenger, Fair Haven, Mich., is a dealer in the Michigan territory. Edmund Supply Co., Toledo, and Southern Ohio Equipment & Supply Co., Zanesville, are subdealers in the state of Ohio.

### To Work With Caterpillar Dealers

M. H. Hulings, Assistant District Representative in the Plains Division of the Caterpillar Tractor Co., Peoria, Ill., will work with B. J. Kluesing in contacting distributors in North and South Dakota and in Saskatchewan Province. The dealers in this area include J. P. Foster Co., Sioux Falls, S. Dak.; West River Equipment Co., Rapid City, S. Dak.; Dakota Tractor & Equipment Co., Fargo, N. Dak.; and Kramer Tractor Co., Ltd., Regina, Saskatchewan.

### Huber Names Western Machinery

The Western Machinery & Engine Co. of St. Louis, Mo., is now distributing Huber road-building and maintenance equipment in eastern Missouri and central and southern Illinois. The firm just recently expanded its engine-distributing business to include heavy-construction machinery.

"Service Is a Business" is the company motto. Its record proves also that "Service Is a Profitable Business." At the head of Western Machinery is President Hugh Scott, Sr. Gilbert A. Weidlich are Vice Presidents; Gilbert J. Nichols is Secretary and General Manager; John H. Heintz is Manager of the construction equipment division; Melvin Lusader is Manager of the Centralia, Ill., branch; and Robert Gamel is Service Manager.

### Cummins Dealer in Connecticut

Cummins diesels are now being sold and serviced in Connecticut by Cummins Diesel Engines of Connecticut, Inc., formerly Cummins Diesel Engines of New England, Inc., with headquarters at 37 Airport Road, Hartford. There is no change in the management and personnel of the company. J. A. Mango remains as President. However, service facilities will be increased by adding 7,500 square feet to the shop area.

(Concluded on next page)


BUILT FOR INDUSTRIAL POWER NEEDS EVERYWHERE!

CHRYSLER

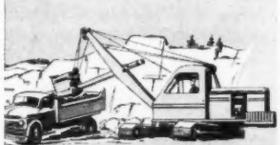
HORSEPOWER WITH A PEDIGREE

Day-in, day-out! . . . developing maximum horsepower with a minimum of down time and at minimum operating cost! That's the outstanding record of Chrysler Industrial Engines on the job!

For Chrysler Industrial Engines are built *solely for industrial use!* They are designed and engineered to meet the *specific working requirements* of each type of equipment they power. Chrysler Industrial Engines can also be adapted to special regional operating conditions.

A letter of inquiry will bring an engineer well qualified to discuss your particular application. Address: **Industrial Engine Division, Chrysler Corporation, Detroit 31, Mich.**

**CONSTRUCTION**



**Chrysler Engines Power:** Ditching Machines • Cranes • Truck Mixers • Shovels • Loaders • Yarders • Road Pavers • Concrete Mixers • Crane Carriers • Scoop Tractors

**INDUSTRY**

**Chrysler Engines Power:** Air Compressors • Pumps • Hoists • Derricks • Tractors • Generators • Arc Welders • Baling Machines • Winches • Conveyors • Tackle Blocks

**FARMING**

**Chrysler Engines Power:** Tractors • Combines • Hay Choppers • Gang Mowers • Spreaders • Pumps • Feed Mills • Irrigation Equipment • Orchard Sprayers • Sprinklers

**OTHER FIELDS**

**Chrysler Engines Power:** Locomotives • Fire Pumps • Motor Coaches • Drilling Equipment • Pulp Machines • Snow Plows • Oil Well Pumps and Drillers • Street Flushers • Air Conditioning Equipment

## Distributor Doings

*(Continued from preceding page)*

Cummins diesels will be handled in Maine, New Hampshire, Vermont, Massachusetts, and Rhode Island by Cummins Diesel of New England, Inc., 201-09 Cambridge St., Boston, Mass. Walter N. Westland heads this company.

### Square Deal Has Foote Line

Square Deal Machinery & Supply Co., Orlando, Fla., is handling the Adnun Black Top Paver and the MultiFoote paver line made by The Foote Co., Nunda, N. Y., subsidiary of Blaw-Knox

### Electric-Hammer Dealers Wanted

Dealerships are open for the recently introduced Kango electric hammer. The hammer comes in three sizes designed to do a variety of drilling, tamping, and driving work. Information on territories may be obtained from Allied Tools, Inc., 321 Central Ave., Newark 4, N. J.

### Kentucky Dealer for Pioneer

Williams Tractor Co., 3800 Crittenden Drive, Louisville, Ky., is exclusive distributor in Kentucky for Pioneer Engineering Works, Minneapolis, Minn. The dealer company's twelve salesmen will cover the state for the Pioneer line of jaw crushers, roll crushers, feeders, screens, conveyors, complete rock and gravel plants, and central-mix asphalt plants.

### Hyster Man Joins Dealer Company

John E. Mitchell, for the last two years Manager of the North Central District of the Hyster Co., Portland, Oreg., has joined the Field Machinery Co., Hyster dealer in Boston, Mass.

### Dealers for Termite Drills

Termite Drills, Inc., Pasadena, Calif., has named Clark & Sawyer, Inc., Los Angeles, Calif., its sales representative for all states west of the Mississippi River. The Specialty Co., Inc., Lakeville, Conn., is sales representative for all territory east of the Mississippi. John H. MacIntyre & Co., El Monte, Calif., handles export sales of Termite drills.

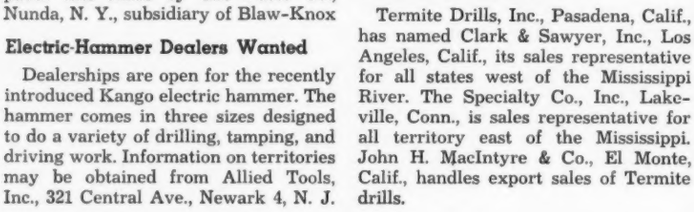
### Barco Appoints Stillwell

The Stillwell Supply Corp., Long Island City, N. Y., is distributing the gas-driven rammers, drillers, and hammers made by Barco Mfg. Co. Stillwell also represents Construction Machinery Co., Mall Tool Co., and King Mfg. Co.

*Dealers—this is your department, so send us your news—new plants, new lines, new staff appointments.*

## Warehouse for Goodrich Built by H. K. Ferguson

B. F. Goodrich Co. has a new tire and tube warehouse in Los Angeles. It is a one-story building which has 100,000 square feet of floor space. Built by The H. K. Ferguson Co., this $375,000 warehouse has no interior walls or windows and is ventilated by eight 36-inch fans.



*C. & E. M. Photo*

**Almost 1,000 people attended the recent open-house at the new headquarters of Eastcoast Equipment Co. on Route 29 in Mountainside, N. J. The service and parts department are in the front, the offices upstairs. The shop is at the back.**


SAVE 1/3 ON PORTABLE ELECTRIC PLANTS

New Winpower Portable Plants, powered with heavy-duty Wisconsin engines save you approximately 1/3 on purchase price. Especially designed for contractor use, with full range of sizes, 300 to 10,000 watts. Quality built for 25 years—famous for long, dependable service. Write today for free literature and prices.

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CONTROL POWER BETTER

Largest to Smallest
TRUCKS
Benefit by Using
ROCKFORD
CLUTCHES
A wide range of automotive units, from the largest crawler-type tractor to the smallest short-coupled truck, operate reliably, efficiently and economically thru using ROCKFORD heavy duty CLUTCHES.
BW
Let our engineers show you how ROCKFORD CLUTCH design and construction advantages will benefit your product.

ROCKFORD CLUTCH DIVISION
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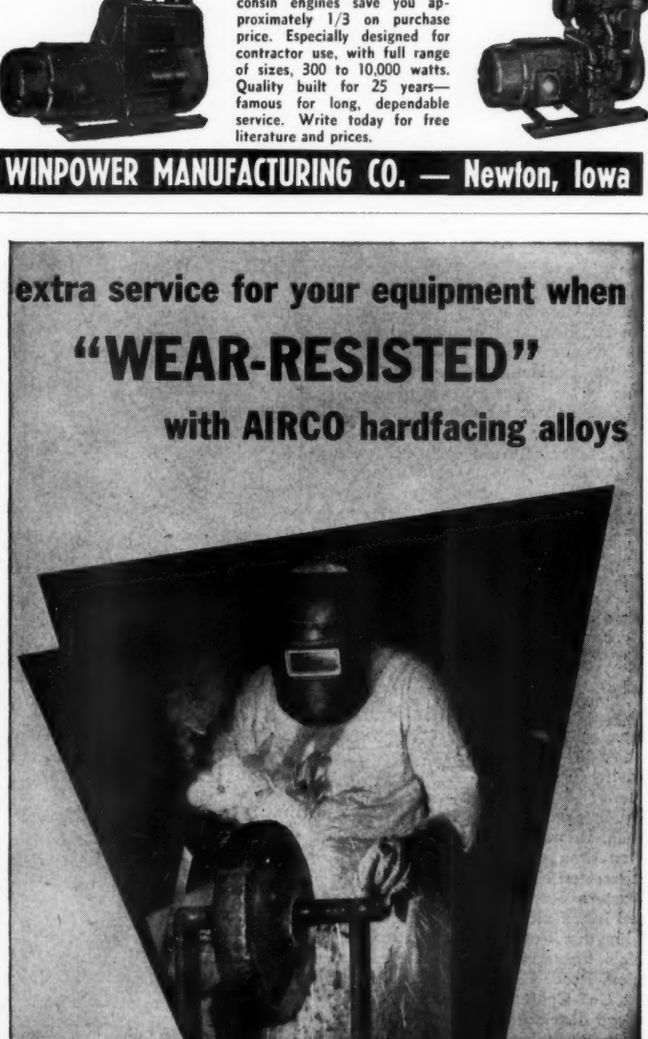
ROCKFORD CLUTCHES

extra service for your equipment when
"WEAR-RESISTED"
with AIRCO hardfacing alloys



Because of the hardness and other desirable characteristics of these alloys, they provide high resistance to all types of wear — abrasion . . . impact . . . heat . . . corrosion. One application often adds 2 to 25 times longer service life to *worn or new* parts . . . big dividends in savings of "down-time" and replacements.

There is an Airco alloy available for oxyacetylene flame or electric arc application to meet all types of wear conditions.

1. *Severe abrasion and medium impact*
2. *Shattering impact and abrasion*
3. *Severe impact and abrasion*
4. *Sliding abrasion and impact*
5. *Extreme earth abrasion*
6. *Corrosion and heat*

Constant research is developing new alloys to meet special wear problems as they occur.

If you have parts or tools subject to any type of wear, it will pay you to investigate the savings you can make in maintenance and replacement costs by using Airco Hardfacing Alloys.

*For further information about Airco's complete line of "wear-resistant" alloys, write your nearest Airco office or Authorized Dealer for a free copy of the Hardfacing Alloys Catalog.*

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# New C.B.&Q. Cutoff Pushed in Missouri

## Major Line Construction Near Kansas City Calls for Heavy Rock Grading Through Rough Terrain

*C. & E. M. Photo*

**A Northwest 80-D loads a 25-yard Euclid in a rock cut for the new C. B. & Q. line.**

• MAJOR railroad construction in the United States is not over. Streaking straight as a die from Missouri City Junction to the existing C. B. & Q. line at Needles Junction, near Brookfield, Mo., a modern new 71-mile major cutoff is being built by the Chicago, Burlington & Quincy Railroad. Throughout the winter three contractors remained as busy as possible to push the new railroad to completion. It will be November 15, 1951, before the line is ready.

In honor of Burlington's 100th birthday in 1949, the new line is called the Centennial Cutoff. Designed solely as a rapid-transit cutoff to speed trains into Kansas City, it will shorten the old line by 22 miles and speed train time immeasurably. The new line will be modern in every detail. Train time between Kansas City and Chicago will be shortened appreciably when the new cutoff comes into use.

The work is being done in three contract schedules. Starting at the Missouri City Junction, or west, end, the schedule (III) calls for 42.6 miles through the roughest part of the entire terrain. List & Clark Construction Co. of Kansas City, Mo., has the $3,575,000 prime contract on this section. In order to help speed the work, List & Clark has subbed 16 miles of grading to Perry-McGlone Construction Co. of Kansas City. Bridges and culverts on this schedule were subbed to Maxwell Bridge Co. of Columbus, Kans.; List & Weatherly Construction Co. of Kansas City; and Kansas City Bridge Co. of the same city. Vogt & Conant, Cleveland, Ohio, also is doing some of the bridges in schedule III.

Schedule II, 21.8 miles in length, extends from Tina Junction to Forker Junction. The $988,000 contract is being hurried along by John P. Abramson Co. of Des Moines.

Schedule I, on the eastern end, consists of a 6.4-mile section. Cameron-Joyce of Keokuk, Iowa, has the $21,000 contract.

### Aerial Surveys Help

The 71-mile line was located with the help of aerial photographic transparencies. USGS quadrangle maps and other local data supplemented information on the aerial shots. On the profile maps, the aerial photographs were also placed, and they were of immense help in speeding the layout of the work. Strangely enough, the new location practically duplicates that of a 1902 survey, which was necessarily slow and laborious. The older survey had a few more curves to avoid the deep cuts modern machinery has made practicable. The new road is straight for many miles at a time, and its maximum grade is 0.8 per cent.

Design standards are extraordinarily high, and Professor K. B. Woods, well known soils expert from Purdue University, is acting as consultant on the compaction of embankments.

Side borrow pits are a rarity, and Burlington design engineers chose rather to widen cuts slightly when additional fill material was necessary. Excavation quantities are balanced, generally, between cut and fill. Maximum curvature of the new line is 1 degree, and one tangent section is 16 miles long . . . "monotonous", according to C. E. Clark, Jr., General Superintendent on schedule III.

Live-load design of railroad bridges equals the Coopers 72 formula, and H20 AASHO standards were met in the many highway overpasses which cross the railroad.

Facts and figures regarding the cutoff are impressive. Total cost of the 71-mile railroad section will be $16,000,000. Of this total, $865,000 was spent for right-of-way. Total cost of structures was $4,175,000. Ballast, ties, and track ran $59,250 per mile.

*(Continued on next page)*


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**More Miles Per Day—
More Miles in the Life of Your Trucks**

Trucks with Eaton 2-Speed Axles "make time", not only on the open highway, but in city traffic as well. Even more important, Eaton 2-Speed Axles save wear-and-tear on engine and power transmitting parts; keep trucks in service, and add thousands of miles to vehicle life. Many exclusive features combine to give Eaton axles long life with minimum maintenance cost. Planetary gears distribute loads over several gear teeth, dividing the stress. Positive lubrication, even at slow speeds, reduces friction wear. Ask your truck dealer to explain how Eaton 2-Speed Axles pay for themselves over and over.

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## New C. B. & Q. Cutoff Pushed in Missouri

*(Continued from preceding page)*

Of a total of 8,460,000 cubic yards of grading, about 750,000 was classified as rock. There are six passing tracks each 7,800 feet long; 74 highway grade crossings; 3,900 feet of rolled-beam, truss, and girder bridges; 3,700 linear feet of concrete boxes; 16,000 linear feet of metal-pipe culverts; 4,700 feet of concrete-pipe culverts; and 2,500 linear feet of timber-trestle bridges.

### List & Clark Contract Biggest

The List & Clark contract is a mammoth grading project, and because of its heavy cuts through rock, was perhaps the most spectacular of the three jobs. Modern grading methods and heavy machinery mark the List & Clark operations.

C. E. Clark, Jr., General Superintendent in charge of field work for this company, uses an exceptionally well organized method of excavation. As a pioneer measure, three Caterpillar D8's with LaPlant-Choate 14-yard scrapers moved in and opened up the cuts. For a short time a fourth LaPlant-Choate scraper, pulled by an International TD-24, also helped out. The function of this pioneer fleet was to take care of all short-haul work up to about 600 feet, and to get the cuts opened up so other equipment could work. Generally speaking, scraper work was done in the clay topsoil and subsoil overburden which lies in varying thicknesses over limestone formations.

Following the scraper work, a fleet of seven LaPlant-Choate Motor Scrapers moved up, assisted by an Allis-Chalmers HD-19 pusher. These machines continued grading work where the scrapers left off, and hauled dirt for distances up to 2,000 feet. There was a considerable percentage of the job where these machines were used to excellent advantage. Work by these machines carried grading down to the top of Winterset limestone, a heavy bedded layer which outcrops in many parts of Missouri.

Rock portions of cuts consisted of three limestone layers separated by planes of soft shale. Below the shallow Winterset layer was a 22-foot bed of Bethany Falls limestone, and then a layer of Henrietta lime. All three beds were separated by shale seams which were generally horizontal. All rock work required drilling and blasting before the material could be removed.

Blasting was done so accurately that slopes very close to neat lines were established. A 750-cfm Joy compressor and a 500-cfm Gardner-Denver, with their unloading valves timed together, fed compressed air to a common surge tank. To add to the air storage, and rather than to move the compressors often, 4-inch pipe was sometimes laid for 700 or 800 feet ahead. The 4-inch line then fed to a smaller receiver, equipped with a moisture trap, and 2-inch flexible hose from the smaller receiver fed the drills.

Drilling equipment consisted of 4 Joy wagon drills, with two Gardner-Denvers and one Ingersoll-Rand. There was enough air available to operate five wagon drills at one time. In softer material such as shale and soft rock having a tendency to break out in larger pieces under drilling, four Hardsocg augers mounted on wagon-drill frames were used.

All hard drilling was done by Joy throw-away bits in 2¼, 2⅛, and 2-inch sizes. Maximum length of steel was 24 feet. Cleavage planes in the harder limestone were such that the entire mass had to be removed at once for the most precise results, and that meant in the case of the Bethany Falls formation that 24-foot steel would barely make it through.

The holes were accurately spotted on a 5 x 7-foot pattern, and the cut floor was maintained level enough so the drills could sink their holes vertically without trouble.

List & Clark divided its extensive powder business among three companies in Kansas City, with the result that Du Pont, Hercules, and Atlas explosives were used. In harder rock it was necessary to use 40 per cent gelatin in 1⅛-inch sticks, but much of the softer material broke up nicely when 2-inch cartridges of 20 per cent powder were used.

The holes were drilled and loaded exactly to grade lines, without springing of any sort. From 500 to 650 holes were blown at once, using a 440-volt Caterpillar generator set.

One of the things which made blasting so precise was the use of at least two rows of delays along the slopes. Often three rows were used. The center portion of the cut fired instantly since zero delays were used there.

*(Continued on next page)*


NEW IMPROVED

Maginniss HI-LECTRIC CONCRETE VIBRATOR

PATENT NO. 2478701

HAS

*No Flexible Shaft*

*9500 Vibrations a Minute*

*Electric Motor In Head*

*Write today for complete information*

DEALERSHIPS OPEN

Maginniss POWER TOOL CO.

154 DISTL AVE., MANSFIELD, OHIO

Bulldozers, trucks and other equipment have a busy time as grading swings into high gear through rough terrain.


*Improving U.S. 111, near Harrisburg, Pa.*

Left to right: Charles G. Kleckner, resident engineer, Pennsylvania Department of Highways; Clair Crum, bridge foreman, and D. W. Kuhn, of Reed & Kuhn, subcontractors for bridges.

Workmen tie Bethlehem Reinforcing Bars prior to pouring of concrete. Bethlehem Bars were also used in three additional bridges for new highway.

To provide a better, safer road, U. S. Route 111, popular Harrisburg to Baltimore highway, was recently relocated in Newberry and Fairview Townships, south of Harrisburg. The 31,193-ft project was authorized by the Pennsylvania Department of Highways, and included the erection of four bridges. Contractor was Central Pennsylvania Quarry, Stripping and Construction Co., Hazleton, Pa. Reed & Kuhn, Elysburg, Pa., handled the bridge erection. Bethlehem furnished reinforcing steel, bar mats, and dowel units.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

*On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation*

Power shovel, rigged with Bethlehem Wire Rope, loads heavy-duty truck. Bethlehem Wire Rope sees plenty of tough service in road construction.

**STEEL FOR HIGHWAYS**

Dowel Units • Reinforcing Bars • Bar Mats • Guard Rail
Guard Rail Posts • Wire Rope and Strand • Pipe
Hollow Drill Steel • Spikes • Bolts and Nuts
Timber Bridge Hardware • Tie-Rods
Sheet- and H-Piling • Fabricated Structural Steel

BETHLEHEM STEEL

C. & E. M. Photo

**The first day of spring was a cold one on List & Clark's job—but not too cold for a confab between General Superintendent C. E. Clark, Jr. (left), and Assistant Engineer of Construction, A. J. Strobel.**

Where three rows of delays were used, the third row from the outside, equipped with 50-millisecond delays, fired next. Then came a row of 100-millisecond delays, and finally a row of 150-millisecond delays on the extreme outside. Use of delays controlled overbreak and will probably mean much less maintenance work in the future for railroad section gangs in the deep cuts.

This drill-blasting method left the rock so well fractured that it could be used in fills and handled by bottom-dump Euclids. The first loading team consisted of a Northwest 95 dragline with a 5-yard bucket. It handled loading of five 25-yard bottom-dump Euclids. A Northwest 80-D handled six 13-yard Euclids with its special 3.2-yard dipper. Finally, another 80-D with a dipper of the same size loaded five 25-yard Euclids.

The special dippers on the Northwests were shop-assembled by cutting standard dippers in half, and then fitting in special manganese inserts manufactured by the maker of the dipper. When the field welding was finished, List & Clark had dippers of the right size to load the Euclids properly. At the same time, the oversize dippers would handle rock fragments of a size that would dump through the bottom doors of the hauling units.

The biggest cut on List & Clark's job was 110 feet deep, measured along the ½ to 1 slope. It contained 465,000 cubic yards of rock excavation and 300,000 cubic yards of common. Average haul on this cut was 9,000 feet one way, and some of the other hauls ranged up to 2 miles.

Cuts and fills differed somewhat from usual railroad-type dirt work. Cuts in earth were bottomed with a 50-foot width, while 40-foot widths prevailed in rock cuts. Earth slopes were staked 1½ to 1, while rock cut slopes were ½ to 1. Embankment slopes were built on 2 to 1 grades. Fills under 15 feet high were built to a top width of 24 feet. The top was widened a foot for each 15 feet of height above the initial 15 feet. Maximum width was 27 feet, and it was on a 64-foot fill.

Embankments were built to an extremely high degree of compaction for railroad work. Specifications required six sheepsfoot roller passes and 95 per cent compaction at optimum moisture content. Much of the soil was a sandy clay loam, and it worked nicely. But sheepsfoot rollers were used even on the rocky fills. Three large Gebhard sheepsfoot tampers, drawn by D8's, were available.

In order to protect the high embankments from moisture seepage, some of the fills over 25 feet will be sealed with 1.2 gallons of asphalt applied in 0.7 and 0.5-gallon shots per square yard. The asphalt protection over the entire width of roadbed will prevent rain from seeping down through the ballast. Applied by pressure distributors, the asphalt will be lightly rolled by pneumatic-tired equipment.

### Equipment Upkeep

One of the best-equipped shops for the maintenance of equipment was set up near the town of Orrick by List & Clark. The shop consisted of a 40 x 120-foot tin building, set adjacent to the parts room and warehouse nearby.

The shop was thoroughly equipped with all the things good mechanics need to service modern engines and equipment. It had 8 compressed-air outlets, with 350-pound pressure supplied by a stationary Gardner-Denver compressor. It had plenty of electric outlets, and there were four fire extinguishers along each side. Only once did they have a fire which required two extinguishers. Mechanics worked in zero weather in comfort, because the shop was equipped with one large and three small Silent Glow heaters. A 2-ton overhead crane ran the full length of the shop, and it was fitted with two Yale hoists.

The shop also had a battery-charging room, an engine-repair room, a 100-ton hydraulic press, and plenty of heavy-duty tools to make necessary repairs.

On hand in new condition at all times were engines for three types of Euclids, and a spare engine for the LaPlant-Choate Motor Scrapers. If major repairs to an engine were necessary, they simply opened the shop doors, ran the equipment in, removed its engine, and set the new one in. The defective engine was then repaired at leisure.

Manufacturers' service recommendations were carried out on all equipment, too, as mechanics and grease monkeys from the shop visited all units daily.

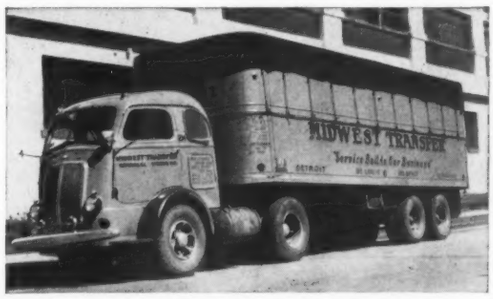
*(Concluded on next page)*

Now... a model and size to solve any hydraulic line problem!
Standard and Break-A-Way types.
Connect under any pressure without tools.
WRITE FOR FULL DETAILS
ULRIX QUICK COUPLERS
For All Hydraulic Lines
ULRICH MFG. CO.
ROANOKE, ILLINOIS

Now, greater protection for harder working heavy-duty fleet engines

New and better...

STANOLUBE HD-M
REG. U. S. PAT. OFF.
Motor Oil



For nine years, STANOLUBE HD Motor Oil has demonstrated its ability to cope successfully with the most difficult problems of lubrication in automotive diesel and heavy-duty gasoline engines. Now, all of the outstanding qualities of this product have been incorporated in a new and better heavy-duty lubricant: STANOLUBE HD-M Motor Oil.

In extensive field tests, new STANOLUBE HD-M has proved its ability to benefit harder working heavy-duty fleet engines these two ways:

**1. Extends engine life.** Because of improved detergent-dispersant action, new STANOLUBE HD-M keeps engines clean under severe conditions imposed by adverse fuel quality, higher operating temperatures, and prolonged periods of hard operation. Freedom from harmful deposits means less wear, longer life for fleet engines.

**2. Reduces maintenance.** Because it has greater oxidation stability, new STANOLUBE HD-M helps keep pistons, rings and valve stems free from varnish-like deposits caused by oil oxidation and provides protective films of oil in the face of high operating temperatures. Less wear of engine parts, longer periods between overhauls mean less overall maintenance.

A Standard Oil lubrication specialist can help you obtain maximum lubrication benefits from STANOLUBE HD-M. To reach him, just phone your local Standard Oil Company (Indiana) office.

Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

**A Complete Line of Motor Oils for Every Heavy-Duty Service Need**

**STANOLUBE HD-M** is recommended for all internal combustion engines. It meets U. S. Army specification MIL-0-2104. This lubricant provides excellent cleanliness, low wear rate, and low oil consumption under severe operating conditions. Available in all SAE grades.

**STANOLUBE S-1** is recommended for use in automotive, diesel, or gasoline engines where other heavy-duty oils cannot control deposits caused by operational severity or adverse fuel quality. It meets requirements of MIL-0-2104 and the requirements for "series 1" type oils as well. Available in all SAE grades.

**STANOLUBE HLA** is recommended for use in supercharged diesel engines and in other engines that operate under the most adverse conditions. It meets the requirements of MIL-0-2104 and the requirements of "series 2" type oils. Available in SAE 10 and SAE 30 grades.

STANDARD OIL COMPANY (INDIANA) STANDARD

*C. & E. M. Photo*

**This Gebhard sheepsfoot roller, one of several on the C. B. & Q. Cutoff project, compacted the railroad embankments to a high degree.**

## New C. B. & Q. Cutoff Pushed in Missouri

*(Continued from preceding page)*

### Rails Ahead of Ballast

An improved method of laying the track is also a feature of this project. Subballast is distributed on the finished subgrade by trucks, and ties, rail, and fittings are also trucked and placed along each side of the roadbed from where they are handled by the gangs constructing the track. Then a work train with cars of ballast comes in over the new track, dumps the material, and the track is then tamped and lined to final grade and line.

*C. & E. M. Photo*

**Hardsocg augers on wagon-drill frames solved the problem of drilling in shale for List & Clark, contractor for the new C. B. & Q. cutoff near Brookfield, Mo.**

All construction materials were furnished to the contractors by the railroad company.

When the new line goes in service late this year, the Burlington expects to improve substantially both passenger and freight service between Chicago and Kansas City. A dream the Burlington officials have had for many years will then be realized, because the new line has been practically a half century in conception.

Back in 1851-1859 the present C. B. & Q. railroad line from St. Joseph to Palmyra and Hannibal was built by the old Hannibal & St. Joseph Railroad Co. The line from Cameron Junction to North Kansas City was completed in 1867. The C. B. & Q. bought the existing lines in 1901.

And so when fast trains begin to use the new track, they will be following a route engineers dreamed of long ago, but one which was not practicable before the era of large earth-moving machinery.

### Personnel

Henry A. Aalberg, Assistant Chief Engineer, is in charge of the entire 71-mile project, with Chief Engineer H. R. Clarke in general charge. F. O. Schafer, Engineer of Construction, and his assistant, A. J. Strobel, have charge of field work. Resident Engineers are N. D. Hill, F. R. Lieber, and B. W. Steffaraud.

For the contractors, on schedule III, C. E. Clark, Jr., was General Superintendent. Roy Gray was in charge for Maxwell Bridge Co. Harry Lindblom was General Superintendent for John P. Abramson Co. on schedule II, and T. T. Gammon was General Superintendent on schedule I.

## Centric Clutch Expands

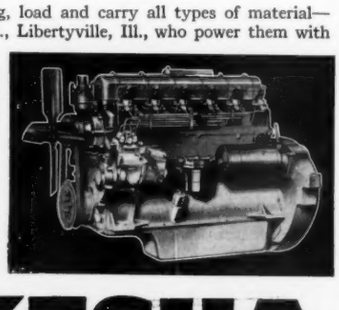
The Centric Clutch Co., maker of Rawson centrifugal clutch couplings, has moved into a new building at the junction of Main Street and Route 35 in Woodbridge, N. J. The one-story plant has about 10,000 square feet of floor space—more than four times the space in the old plant at Cranford, N. J.

*Payloader* in use by City of Waukesha is powered by a **Model DLCA Waukesha Diesel Engine.** (The truck has a Waukesha Engine, too.)

● The home-town folks are not easily impressed. They know you and your product, too. Save your sales talk—they pay off on performance.

This comes to you direct—from the home of Waukesha Engines. And it's Mr. W. E. Dick, City Engineer, talking—"The City of Waukesha, Department of Public Works, now has twelve pieces of engine-driven machinery . . . powered with your engines. Among the most satisfactory units we own is the Hough *Payloader* which we have had in constant use . . . the lively acceleration and quick pick-up of your power plant in this machine, and the speed and flexibility of itself in maneuver, is beyond description . . . (it) handled so quickly, and with so little interruption to traffic, the heavy snows, sleet and ice that clogged gutters and crossings. Any bulk material loading job is easily and quickly handled by this versatile rig . . . also very useful in grading. This Hough *Payloader* with Waukesha power can't be beat."

*Payloaders*—tractor-shovels that dig, load and carry all types of material—are made by The Frank G. Hough Co., Libertyville, Ill., who power them with Waukesha Engines. Mr. Dick can tell you why. He has "been using your (Waukesha) power plants for years with complete satisfaction. The durability built in, leaves nothing to be desired." Get Bulletin 1411.



**WAUKESHA MOTOR CO., WAUKESHA, WIS.**
**New York • Tulsa • Los Angeles**

**Model DLCA Waukesha Diesel Engine**—six cylinders, 3¾-in. bore x 4-in. stroke, 265 cu. in. displacement, 85 maximum hp at 2600 rpm.

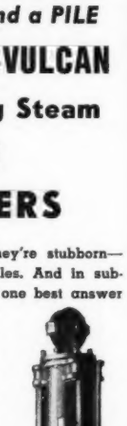
**WAUKESHA** *Diesel* **POWER**

136

*You've got to use FORCE on a mule . . . and a PILE*

**WARRINGTON-VULCAN**
**Single-Acting Steam**
**PILE HAMMERS**

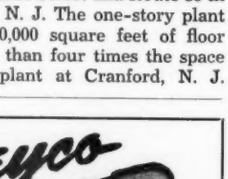
● It takes FORCE when they're stubborn—whether they're mules or piles. And in subduing stubborn piles there's one best answer—Warrington-Vulcan Single-Acting Steam Pile Hammers. The Single-Acting Warrington-Vulcan operates at a medium steam pressure, delivers a moderate frequency of low velocity blows from a relatively heavy ram, puts down wood, concrete or steel piles with speed and savings. Its simplicity of design and rugged strength minimize operating, maintenance and mechanical costs. Its rapid, regular and continuous action has been getting proved results since 1887.



Write for detailed information on this economical, dependable, proved-in-action pile driver.

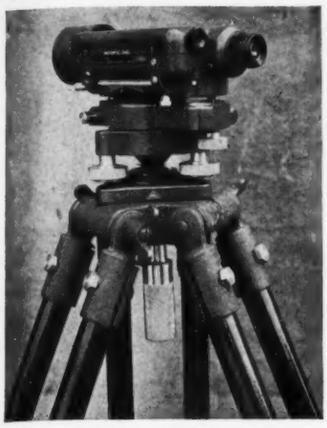
**VULCAN IRON WORKS**
[illegible] N. [illegible] Ave.
Chicago 12 --Illinois

**Greyco**
**Model 60**
**ELECTRIC DRILL**



- Written lifetime guarantee
- Easy to handle
- Powerful
- All ball and needle bearing
- Compact
- 3-Jaw geared Jacobs chuck
- Lightweight
- Patented Jacobs key holder

**Write: Greyhound Arc Welder Corp.**
**604 Johnson Ave., Brooklyn 6, N. Y.**



This Microptic level, made in England by Hilger & Watts Ltd., is distributed in the U. S. by Jarrell-Ash Co.

## New Precise Levels

Another precise surveying instrument made by Hilger & Watts Ltd., London, England, has been introduced by Jarrell-Ash Co., 165 Newbury St., Boston 16, Mass., American distributor. The compact, easily set up Microptic level is designed for precise leveling work. It is finished in green enamel, with all working parts and reading systems totally enclosed in the body. Eyepieces and controls are closely grouped.

There are four versions of this level, each incorporating certain special features. The level may be obtained with prisms or mirror bubble reading, with or without divided circle, and with a 3-screw-leveling base or a quick-leveling base. The kinematic support of the main bubble is designed to insure rigidity of mounting without strain on the glass spirit level. Permanent parallelism between the spirit level and the line of sight is assured, since the bubble chamber containing the supporting contacts is integral with the telescope body.

The prism system offered in level No. 1 permits reading the main spirit level by the coincidence method. Levels 2, 3, and 4 are fitted with graduated bubbles which are viewed in a hinged mirror from the eye-end of the instrument. A divided circle, made of glass, is available with instruments 1 and 3.

The company reports that tests show the glass circle can be made with great accuracy and is easy to read. The circle is graduated to 10-minute divisions, numbered every degree from zero to 359. These are read against the single index line of the microscope and observed—magnified 20 times—in the screw-focusing eyepiece. Readings can be taken to one minute by estimation.

Levels 1 and 2 provide a 3-screw leveling base with a newly designed base plate to insure equal distribution of pressure. Levels 3 and 4 are fitted with a ball-and-socket quick-leveling base. The standard metal case is provided unless preference is shown for one of mahogany or leather. A tripod and various accessories are also available.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 301.

## Wood-Preservative Booklet

A 12-page brochure describing the applications and features of Chemonite wood preservative is available from J. H. Baxter & Co., 200 Bush St., San Francisco 4, Calif. Features claimed for Chemonite are that it is nonleaching, clean, odorless, low in electrical conductivity, paintable, safe to handle, and easily identified.

The literature points out that this product gives four-way protection to structural lumber and timber—it resists decay, repels termites, protects marine structures, and retards fire. Photographs show Chemonite-treated timber in use. Engineering data are given on the composition and application of the product.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 342.

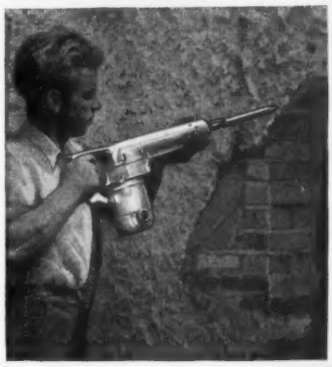
## Concrete Piles and Caissons

A brochure on the services and products of Western Foundation Corp., 2 Park Ave., New York 16, N. Y., is now available. These services include soil exploration, engineering and consultation, pile test programs, pile manufacturing, pile driving, and installation of Drilled-In Caissons.

"A pile for every need" is the claim of the booklet, which describes and illustrates the Button Bottom, Pedestal, compressed-concrete, Caisson, Projectile, composite-wood, driven-core composite, steel H, and pipe piles.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 333.


**Van Dorn POWER gives you**



**THOUSANDS of HAMMER BLOWS per MINUTE!**

Van Dorn Electric Hammers give you hundreds of ways to save construction time and money! They drill in concrete, stone or brick—chip, clean and scale metal—gouge, shape and notch timbers—drive spikes—tamp and vibrate concrete forms—scuff concrete surfaces and remove form marks—handle demolition jobs. Light, compact, completely self-contained. Operate from A.C. or D.C. outlets or portable generator. See your nearby Van Dorn Distributor for free demonstration of four models. Write for catalog to: THE VAN DORN ELECTRIC TOOL CO., 787 Joppa Road, Towson 4, Maryland.

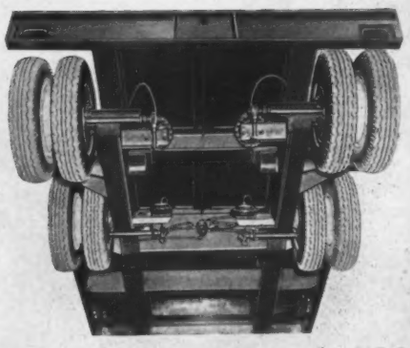
FOR POWER SPECIFY "Van Dorn" PORTABLE ELECTRIC TOOLS

(DIV. OF BLACK & DECKER MFG. CO.)

DORSEY

**LOW BED TRAILER Model MTS**

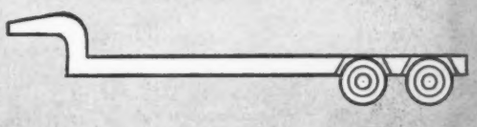
**15 to 35 Ton Capacity**



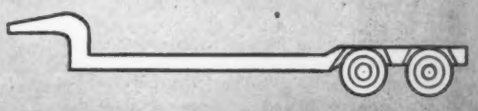
Sturdy walking beam assemblies provide maximum flexibility without distortion. Brake chambers attached directly to walking beam assure maximum braking efficiency.

**The Most Popular Low Bed Model due to these features:**

- Tandem Axles — (50 inch spacing)
- Maximum stability over uneven surfaces
- Easier pulling gives excellent performance both on and off highway
- Ideal for road patrols and all other types of construction equipment
- Available in both semi and full trailers, level and drop decks



Standard unit with level deck fills most requirements. 6' Drop Deck available at extra cost.



**DORSEY TRAILERS**

ELBA ALABAMA

# Tries Rubber-Asphalt For Road Resurfacing

## Massachusetts Maintenance Program Calls for Rubber in Bituminous Pavements on Widely Used Highways

• LAST year the Massachusetts Department of Public Works continued the use of rubber in bituminous mixes for resurfacing highways badly in need of maintenance. This program got a start in 1949 when two rubber experimental sections were laid, each about 1,000 feet in length. One of these sections on State Route 1A between Wrentham and Plainville contains Surfa-Sealz, a U. S. Rubber Co. compound. The other section, on State Route 2 near Concord, was put down with emulsified rubber asphalt, designated in Massachusetts DPW parlance as an ERA mix.

In the 1950 construction season, the Department's program was expanded to include 23 resurfacing projects, totaling 40 miles, in which rubber was used. Regular blacktop resurfacing without rubber was done on 56½ miles of Massachusetts highways. Most of these rubber-resurfacing projects were short, averaging from ¼ to one mile in length, with the exception of a 5-mile stretch on U. S. 1 south of North Attleboro where the pavement is four lanes wide.

All this latest reconstruction with rubber is still considered to be in the experimental stage. For comparison purposes, portions of the same resurfacing project were laid without any rubber. Where rubber was put in the mix, three different types—natural, synthetic, and reclaimed—were used so that their respective merits can be determined after being subjected to traffic. As a general rule, the paving consisted of both a bottom or binder course, and a top or surface course.

### Used With Bituminous Concrete

The mix in which the rubber was blended is Massachusetts' well known Class I, Type I-1 bituminous concrete that conforms to the following composition limits:

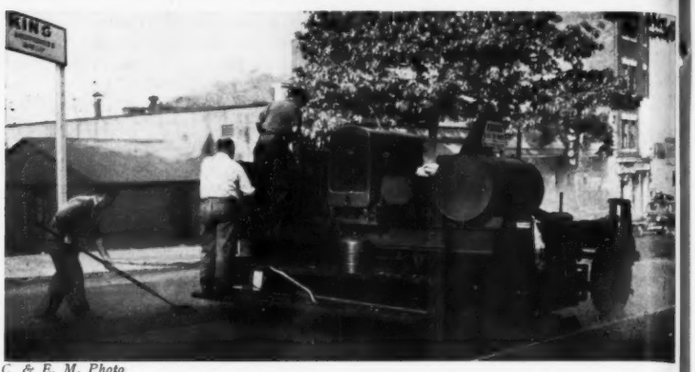
| Sieve Size | | Per Cent by Weight | | | |
|---|---|---|---|---|---|
| Passing | Retained | Bottom Course | | Top Course | |
| Coarse Aggregate | | Min. | Max. | Min. | Max. |
| 1-inch | ..... | 100 | .. | .. | .. |
| 1-inch | ¾-inch | 0 | 10 | .. | .. |
| ¾-inch | ½-inch | 35 | 65 | .. | .. |
| ½-inch | ..... | .. | .. | 100 | .. |
| ½-inch | No. 4 | 10 | 30 | 20 | 60 |
| No. 4 | No. 10 | 5 | 15 | 10 | 35 |
| Fine Aggregate and Mineral Filler | | | | | |
| No. 10 | ..... | 15 | 30 | 30 | 45 |
| No. 10 | No. 20 | 2 | 10 | 4 | 15 |
| No. 20 | No. 40 | 2 | 8 | 4 | 16 |
| No. 40 | No. 80 | 2 | 10 | 6 | 20 |
| No. 80 | No. 200 | 1 | 6 | 5 | 16 |
| No. 200 | ..... | 1 | 6 | 4 | 9 |
| Bitumen (Sol. in $CS_2$) | | 4 | 6 | 5 | 8 |

The coarse aggregate was crushed stone throughout; gravel was not permitted. Limestone dust was used for the mineral filler. The asphalt cement had a penetration of either 85 to 100 or 100 to 120.

For bottom and top courses on the natural-rubber project, 6 per cent of pure natural rubber (based on the binder content of the mix) in the form of "crumbs" was added as an aggregate to the pug. On the synthetic-rubber project, 7.5 per cent of the synthetic-rubber compound, representing 6 per cent of rubber hydrocarbons based on the binder content, was used in both bottom and top courses. On half of this project, the synthetic rubber was added in the form of "crumbs", as an aggregate in the pug. On the other half, the synthetic-rubber compound was preblended in solution with the asphalt. On the Surfa-Sealz reclaimed-rubber project, 12.5 per cent of compound was used in the base course, and 18.75 per cent was used in the top, based on the binder content of the mix. This amount of compound represents 5 and 7.5 per cent of rubber hydrocarbons respectively.

### Laid on Hill

One of the typical projects where a rubber pavement was laid last year included a long hill with a 4 per cent grade on one of the most heavily traveled roads in metropolitan Boston. The ¾-mile job was on State Route 9, the Worcester Turnpike, in the city of Brookline where it is known locally as Boylston Street. The resurfacing extends from Sumner Road to Cypress Street, and measures 50 feet between curbs. A total of 2,800 tons of plant-mix was laid, of which 1,600 tons contained natural-rubber powder, and the remaining 1,200 tons was the regular Class I, Type I-1 bituminous-concrete mix.




*C. & E. M. Photo*

**An Adnun Black Top Paver lays a binder course containing natural rubber powder on a stretch of the Worcester Turnpike in Brookline, Mass.**

The Vulcan Construction Co. of Boston was the contractor supplying and laying the mix which was produced at the company's Watertown plant, a 15-

*(Concluded on next page)*

LOAD IT . . . MOVE IT . . . DUMP IT -
EUCLID
At LOWER COST with
Firestone TIRES
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GROUND GRIP
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ALL TRACTION
When you're handling big loads, speeding them out over your haul roads to dump . . . when you're doing this day in and day out in all kinds of weather, you have to have tires that can "take it."
Firestone Tires can take it, because they're made to take it, made with strong, Gum-Dipped rayon cord bodies . . . made with four extra impact plies to protect the bodies . . . made with double-thick, snag-resistant sidewalls . . . made with extra heavy treads engineered to fit the job.
Give Firestone Tires a trial on your equipment. You'll find that all along the line, trip in and trip out, they speed your work, cut your downtime, and boost your profits.
WHEN YOU BUY NEW EQUIPMENT OR REPLACEMENT TIRES SPECIFY FIRESTONE OFF-THE-HIGHWAY TIRES
Enjoy the Voice of Firestone on radio or television every Monday evening over NBC
Copyright, 1951, The Firestone Tire & Rubber Co.

minute haul from the job. Two courses, each 1½ inches thick, were put down, the binder containing 5¾ pounds of natural rubber to a ton, and the top course 7¾ pounds to the ton. The regular plant-mix, without the rubber, was put down at the eastern end of the project.

The original pavement was bituminous macadam that had been previously resurfaced with a bituminous mix and given a seal coat. Therefore, there were no joints in the foundation to produce joint cracks in the surface, as was the case with other resurfacing projects over concrete. No leveling course was required, nor was any tack coat applied before the paving. Three International trucks, two holding 10 tons and one holding 8 tons, hauled the material from the Warren Roads Co. 1-ton pugmill plant. It was laid by an Adnun Black Top Paver, at an average temperature of 310 degrees F, in 12-foot lanes. The lanes nearest the curb were feathered out by hand to complete the 50-foot width of pavement. The material was compacted by a Buffalo-Springfield 10-ton tandem roller.

With a crew of seven men, the contractor laid an average of 200 tons of plant-mix a day, completing the work within a period of three weeks. Charles Caporetta was Superintendent for the Vulcan Construction Co., and Thurber "Tubber" Handley was Inspector for the Massachusetts Department of Public Works.

### Dual Highway

Another representative job, this time using a synthetic-rubber asphalt emulsion, was the dual-highway resurfacing on State Route 2 between Arlington and Cambridge Circle. The two concrete pavements, each 33 feet wide accommodating three lanes of traffic, are separated by a wide curb-lined grassed median. The road is known locally as the Concord Pike, and the portion resurfaced, which was just beginning to show cracks and scaling, is 6,900 feet long.

Here the plant-mix material totaled 8,800 tons, with the base being 1¾ inches thick and the top 1¼ inches. The job was done by the American Oil Products Co. of Somerville, Mass., where its commercial asphalt plant is also located. The average haul with the hot-top was 5 miles. A Barber-Greene Finisher laid the material in 11-foot lanes, and each course was compacted by a Buffalo Springfield 10-ton tandem roller.

On this project, out in the open country and away from the crowded city streets, one roadway was closed to traffic during the construction operations. Traffic was maintained in both directions over the other half of the dual highway. With no interference from traffic, the work was completed in three weeks, proceeding at the rate of 600 tons of binder or 300 tons of top course per day. Leo Tomasello was Superintendent for the contractor, while Jack Reagan and Anthony J. Densman, Jr., represented the Massachusetts DPW.

### Under Maintenance

The blacktop-resurfacing program is handled by the Maintenance Division of the Department of Public Works. William F. Callahan is Commissioner and Philip H. Kitfield is Chief Engineer; Edgar F. Copell is Executive Assistant in charge of Traffic and Maintenance Divisions, while G. Gordon Love is Acting Maintenance Engineer.

## Data on Trucks to 4 Tons

A booklet on Dodge 2¾, 3, 3½, and 4-ton heavy-duty trucks is put out by the Dodge Division, Chrysler Corp., 7900 Joseph Campeau St., Detroit 11, Mich. It describes the chassis, power plant, and operating features, and gives the specifications of Models R, T, V, and Y.

*C. & E. M. Photo*

**A Buffalo-Springfield tandem 10-ton roller compacts binder course in one of Massachusetts' experimental rubber-asphalt resurfacing projects.**

The construction of the three Dodge Job-Rated engines, with horsepowers of 137, 145, and 154 maximum, is thoroughly explained. Information is given on the ignition system, the twin carburetion and exhaust system, the starting motor, the generator, the sodium-cooled Stellite-faced exhaust valves, and other engine components. Photographs show the chassis and transmission. Safety and comfort features are illustrated and described.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 303.

## Battery Service Bulletin

A bulletin about battery additive AD-X2, a chemical compound designed to decrease sulfation and increase the life of storage batteries, is distributed by Pioneers, Inc., 2411 Grove St., Oakland 12, Calif. This bulletin contains reprints from "The Battery Man", business paper of the automotive electrical industry. It describes the development of AD-X2, names the consulting laboratories which have tested it, cites the experience of users and battery reprocessors, and presents detailed instructions for servicing lead-acid batteries and reprocessing junk batteries.

This literature may be obtained from the company by requesting Bulletin No. 194, or use the Request Card at page 16. Circle No. 324.


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● Extra effort—that's the order of the day as American industry swings into high gear to meet the growing demands of the nation's expanding defense program.

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Model LRSW six-wheel SUPER MACK truck really "gets things done" in strip mining and excavating work—handles its 30-ton loads with round-the-clock dependability.

## Dozer-Blade Rippers For Road Pioneering

Independent ripper units which can be attached to a dozer blade greatly increase the speed and efficiency of brush removal and pioneering work on construction and access roads, according to Hensley Mfg. Co., 828 98th Ave., Oakland, Calif. Ripper units made by this firm can be attached by a bolt bracket to the cutting edge of the dozer, and can be carried with the dozer for use when needed.

The company reports that work done by the U. S. Forest Service demonstrated that the rippers on a 13-foot Le Tourneau Angledozer could uproot 75 feet of brush along a right-of-way in one run before the accumulated load had to be dumped. The rippers are rugged enough to handle big boulders, the manufacturer reports. They are manufactured in 12 different models to fit all standard bulldozers and scrapers.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 255.

These ripper units, made by Hensley Mfg. Co., can be attached by bolt and bracket to the cutting edge of a dozer to make a heavy-duty brush rake.

## An Open-Gear Grease

Several contractors have reported on open-gear lubrication with the No. 32 grease made by Keystone Lubricating Co., 21st and Lippincott Sts., Philadelphia 32, Pa. Their case histories are available from the company. No. 32 grease is supplied in cartridges to fit a specially nozzled gun which ribbons the grease. The company reports that this dispensing method is easy, clean, and fast, and that No. 32 grease repels water, resists removal, has a melting point above 400 degrees F, and retains plasticity with temperatures below freezing.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 286.

## New Catalog on Bearings

A new catalog illustrating and describing a full line of roller bearings and mounted units is available from Shafer Bearing Corp., 801 Burlington Ave., Downers Grove, Ill. It covers pillow blocks, flange units, flange cartridge units, cartridge units, duplex units, take-up units, and take-up and frame units, plus unmounted roller bearings.

Every Shafer bearing is constructed around their company's exclusive ConCaVex design. This consists of concave rollers operating between matched convex races. The features of this design—including integral self-alignment, high shock-load capacity, and extra-low friction—are covered in the catalog. Also highlighted is the Z-seal of the mounted units. This is a full self-centering seal designed to afford positive protection against dirt, dust, and moisture.

The catalog presents many new and larger models of Shafer mounted bearing units with standard shaft sizes now available up to 5-inch diameter. In addition, Catalog No. 51 contains complete engineering and load-rating data and illustrates many product applications.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 349.

## Ryerson Gets Gary Medal

Edward L. Ryerson, Chairman, Inland Steel Co., Chicago, was given the Gary Memorial Medal for outstanding achievement in the iron and steel industry at the 59th General Meeting of American Iron and Steel Institute in New York City on May 24. Mr. Ryerson is a director of the Institute and Chairman of its Committee on Public Relations. His activities as Chairman prompted his selection for the award.


**BOSTROM LEVELS**
*For Half A Century*

No. 5 BOSTROM Convertible Level (with Compass when desired)

Have been the most economical precision leveling instruments on the market.

Used and endorsed by contractors and builders everywhere. Sold on guarantee of satisfaction or money back.

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Write today for literature, prices, and name of our distributor near you.

Simple, Accurate, Durable, Complete

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**Bostrom - Brady Mfg. Co.**
538 Stonewall St., S.W. Atlanta, Ga.

When Rye Lake in Westchester County, N. Y. receded, cutting off three villages from water supply, the crisis was met by putting dependable Gorman-Rupp pumps to work.

**10 INCH PUMP FOR THE BIG JOBS**

At a total head of 15 feet this pump will deliver 4150 gallons of water per minute - more than 15 tons of water a minute. This means a torrent of **249,000 gallons per hour.**

This great 10 inch self-priming centrifugal is **The Pump** for the **Big Jobs** -- in construction, open ditch irrigation, water supply and industrial applications.

Wherever there is a large volume of water to handle call on the Gorman-Rupp "Big Boy" the 240-M, 10 inch pump.

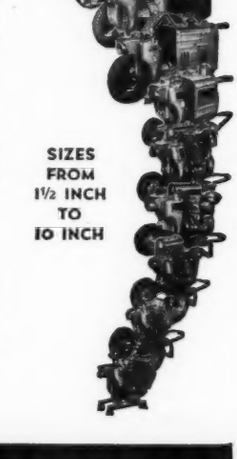
**GASOLINE ENGINE DRIVEN**

Model 31001, 240M, 10 in. 65 H.P. Length 136" (incl. tongue), width 50", height 65". Net wgt. 2870 lbs. Applicable engines include Hercules Model JXD, and Chrysler Model IND-12.

**DIESEL ENGINE DRIVEN**

Same as model 31001. Pump performance follows variance of H.P. available on continuous duty operation of different engines. Applicable units include Detroit Diesel 3031 and 3032, International UD-9 and Hercules DOOD.

*Write for full information and ask for Bulletin No. 8-CP-11.*



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The Power Scythe

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# Steel Mill Under Way On a 3,800-Acre Site

## Contractor Combine Is Constructing the Fairless Works for U. S. Steel; Grading Speeded to Meet Two-Year Schedule

By WILLIAM H. QUIRK,
Eastern Editor

• UNITED States Steel Corp., America's biggest producer of steel, is building a new plant, one of the largest in the world, on a 3,800-acre site south of Morrisville, Pa., across the Delaware River from Trenton, N. J., and only 25 miles from Philadelphia. Although ground was broken just this past March, the construction schedule calls for the completion of the huge plant within 2 years. Four well known and experienced contracting firms have teamed up to construct the project which is expected to cost over $300,000,000. They are Walsh Construction Co. of Davenport, Iowa; B. Perini & Sons, Inc., of Framingham, Mass.; S. J. Groves Contracting Co. of Minneapolis, Minn.; and Slattery Contracting Co. of Long Island City, N. Y.

Fairless Works, named after Benjamin F. Fairless, U. S. Steel President, is located on a site well suited for a heavy industry. The sprawling tract of land is fairly flat, thus avoiding any particularly heavy cut and fill in the grading operations. While the elevation is low—20 feet above sea level being the highest portion of the land—pervious sand and gravel strata beneath the rich topsoil help to supply natural drainage. The Delaware, which provides a deep tidewater channel to link the plant with the sea, also provides the works with an abundant supply of water for its use. Main-line tracks of the Pennsylvania Railroad, also U. S. 1, are within a couple of miles of the north end of the site.

The tract lies in Falls Township, Bucks County, a rich agricultural region, and formerly consisted of several large farms. Once these were acquired, survey parties began staking out the land to give the contractor line and grade for his construction operations. All design, engineering, and general supervision of the work is being done by the Construction Engineering Bureau of U. S. Steel, out of Pittsburgh, Pa.

### Size and Speed

The two outstanding characteristics of this east-coast steel-mill project are its size and the speed at which it is being constructed. Over this 8 square miles of land, the integrated facilities now going up will produce annually 1,800,000 tons of ingot steel. And the five main areas into which the plant is divided are scheduled for completion by the close of 1952. These five areas are: sheet and tin mill, containing a finishing mill 1½ miles long for making sheet steel, tin plate, and other finished products; rolling mill; blast furnaces; open-hearth furnaces; and coke ovens.

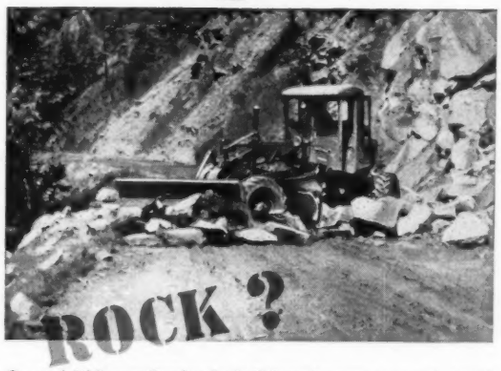
These five areas are spaced widely apart, thus affording ample room for possible future expansion of any or all sections. The ground lying between these mill areas supplied the necessary borrow material to raise the level of the

*(Continued on next page)*

*C. & E. M. Photo*

**Plans for the Fairless Works are studied at the contractor's headquarters by (left to right) John Everhardt, Project Manager for Langenfelder on the dirt-moving; and by Project Manager H. M. Dugan and his Assistant J. J. Murphy of Walsh—Perini—Groves—Slattery, the joint-venture contractor on the project.**


what's YOUR headache...




On an A-W Power Grader the bulldozer becomes a rough, tough tool . . . extra sturdy to match the extra power of ALL-WHEEL DRIVE, and fully up to this job of clearing a rock slide.

Live, climbing power at both ends of the machine keeps it bulldozing steadily through sand where an ordinary grader would find it difficult to travel, let alone work.

On this railroad fill, there is plenty of power and traction to use both blades, with their fingertip hydraulic controls for quick and easy, precision operation.

First, the grader blade with its deep-plowing ability is socked into the ground to undercut the tree roots; then the bulldozer backed by the superpower of ALL-WHEEL DRIVE finishes the job.

The traction and maneuverability of A-W Power Graders make them ideal tools for the Bulldozing jobs found on grading and construction work. Heavily made and reinforced to accommodate the extra power of All-Wheel Drive and Steer, the Bulldozer is an essential for many jobs—a time and money-saver for dozens of others.

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## Steel Mill Under Way On a 3,800-Acre Site

*(Continued from preceding page)*

site at the mill buildings to elevation 20. Elevation of the original ground over the big tract ranged from 4.0 to 20.0. Thus while the dirt work will amount to between 7,000,000 and 8,000,000 cubic yards of excavation, all the required borrow will be taken from pits within the site. If future expansion involves spreading out over the land between the five mill areas, then these borrow pits will be backfilled with material obtained elsewhere.

Along the east and south sides of the steel property flows the Delaware River. Into the south end of the tract a slip will be cut from the river 350 feet wide x 2,500 feet long, with provisions in the design for extending the slip another 2,500 feet if necessary. Ore docks will be built for unloading foreign iron ore which is expected to come chiefly from the Orinoco Mining Co., a United States Steel subsidiary in eastern Venezuela.

*C. & E. M. Photo*

**The first concrete at the Fairless Works goes into foundation piers for the finishing mill—a building 1½ miles long.**

### Construction Preparations

One of the first steps in the new development was enclosing the site with a woven-wire fence, and establishing a police force to guard the huge quantities of materials and equipment that began arriving at the project. Between March 1 and May 1, eight miles of temporary track were laid to serve all five work areas. Eventually these single-track facilities will be expanded to a total of 80 miles of service track. The receiving yard at the north end of the site will have an additional 10 miles of track, from which 15 separate lines fan out to serve the big plant. The design is such that the temporary track will become part of the permanent layout.

Dirt farm roads and secondary blacktop roads are being used wherever possible by cars, trucks, and motorized equipment. In places they must be cut off, and other roads are laid out to provide new access to all parts of the plant area.

U. S. Steel brought power to the site from the nearby lines of the Philadelphia Electric Co. to hook into a temporary substation at the north end of the job. From this station 25,000 feet of line carries a 4,160-volt current to all parts of the tract. The contractor located his principal shops and warehouses adjacent to the substation; all contractor buildings, and the temporary warehouse of U. S. Steel, are outside the plant area proper.

### Big Equipment Fleet

For foundation excavation and site grading, the general contractor assembled a mighty array of construction equipment selected from all four of the joint-venture companies. Excavators, both shovels and cranes, totaled 59, including Bucyrus-Erie, Thew-Lorain, Manitowoc Speedcrane, and Northwest units. As for size, 27 are 2½-yard, 5 are 1¾-yard, 11 are 1½-yard, 11 are 1-yard, and 5 are 20-ton truck cranes. Of the larger crawler models, 5 are employed in pile driving.

For dirt-moving the general contractor has 30 Euclids, half end-dump and half bottom-dump. Both types average 14 yards a load, for the end-dump models are built up with Boulder Dam bodies. For shorter hauls there are 12 LeTourneau 14-yard Carryalls pulled by Caterpillar D8 tractors, with 18 other D8's available for dozer work or pushers. Six Caterpillar motor graders shaped the fills and kept the haul roads in shape.

Some of the dirt-moving item was subbed out to C. J. Langenfelder & Son, Inc., of Baltimore, Md. The subcontractor brought to the job 2 Lorain 820 draglines; a Euclid loader; 22 bottom-dump Euclids; 8 Tournapulls with LeTourneau 19-yard Carryalls; 22 tractors—Allis-Chalmers, Caterpillar, and International—some acting as dozers or pushers, and the rest pulling 10 scrapers—Caterpillar, Gar Wood, and LeTourneau; and 2 motor graders, an Adams and a Caterpillar.

### Concrete and Steel

Large concrete and steel items convey an idea of the magnitude of the project. Concrete will total about 700,000 cubic yards, to be reinforced with 20,000 tons of rods and bars furnished by U. S. Steel Supply Co. The 252,000 tons of structural steel for the buildings will be erected by the American Bridge Co. Steel erection will follow closely behind the reinforced-concrete foundation work. Grading and foundations are expected to be finished by next spring. The contractor expects to reach a peak production of 2,500 to 3,000 cubic yards of concrete per day, working two 10-hour shifts.

Two complete concrete batch plants

*(Concluded on next page)*


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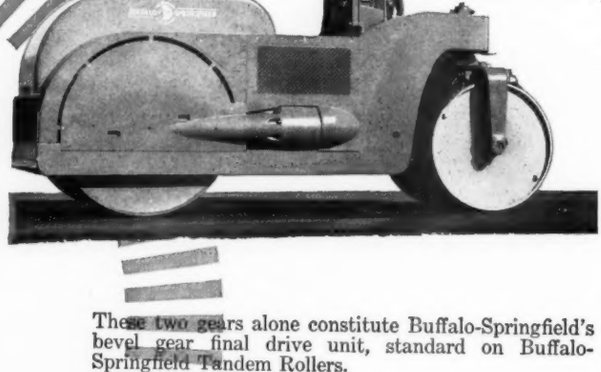
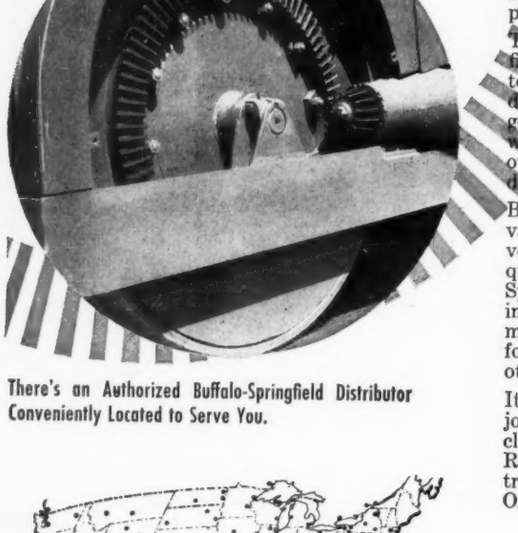


Buffalo-Springfield Heavy Duty Tandem Working on Highway Resurfacing Job.

these teeth put the bite on maintenance costs



These two gears alone constitute Buffalo-Springfield's bevel gear final drive unit, standard on Buffalo-Springfield Tandem Rollers.

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The proven engineering principle behind bevel gear final drive is simply this: Gear wear has a relationship to load in pounds per inch of face. With bevel gear final drive, wider-faced gears can be used, without increasing gear overhang. Thus greater loads can be handled, with less wear, freedom from breakdown, improved operator visibility. Result? Smooth performance, freedom from costly down time and repairs.

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*C. & E. M. Photo*

**An Insley concrete bucket swung by a Speedcrane is emptied over Universal forms for a foundation pier 3 feet 10 inches x 4 feet 11 inches.**

have been set up near the substation with a total capacity of 250 cubic yards an hour. Each plant has a Blaw-Knox 400-ton aggregate bin, and a Butler 3,000-barrel cement silo. Universal Atlas Cement Co. is delivering the bulk cement by rail directly to the batch plant. Sand and gravel aggregate is being supplied by the Warner Co. of Philadelphia, which has large commercial aggregate pits adjoining the steel-mill site. The contractor built additional facilities in the way of bins and conveyors at the aggregate producer's pit so as to insure a steady flow of material. A fleet of twenty-nine 10-yard 10-wheel Mack trucks hauls the aggregate 1½ miles from the sand and gravel pits to the batch plant.

All concrete used on the project is transit-mix, Cooney Bros. of Tarrytown, N. Y., having a subcontract for mixing and transporting the concrete to the forms where the general contractor places it. Cooney Bros. is using a fleet of 25 Autocars and Macks on which are mounted Rex 5-yard truck mixers. Water for the concrete comes from deep wells driven at the plant. Before the batch plant was set up, concrete for the early pours was supplied by Warner Co., which has a fleet of truck mixers serving nearby Trenton, N. J.

Approximately 10,000,000 square feet of forms are required for the concrete work. Universal forms, with wood sheathing and metal hardware and clamps, are used. The first concrete at the plant was poured in the foundation piers for the finishing mill, the initial area where work was started. These building piers are 3 feet 10 inches x 4 feet 11 inches in area, and the form panels are braced solidly with horizontal 4 x 4's, spaced according to the height of the pier. Cranes and buckets placed the concrete delivered by the truck mixers. In the deeper foundation work, wellpoints were resorted to because of the high water table. Most of the building foundations are placed directly on the well packed strata of sand and gravel. Piles were driven where some of the heavier mill machinery required additional support.

### Other Work

As the work progresses, other builders will have a part in the construction of the steel mill. The Wilputte Coke Oven Division of the Allied Chemical & Dye Corp. has a contract to design and build two batteries of 85 coke ovens each, for the production of 916,000 tons of coke for use in the plant's two blast furnaces. The coke ovens will also turn out large tonnages of coal chemical by-products vitally needed in the defense program.

A contract for engineering and building nine open-hearth furnaces was awarded the Freyn Engineering Division of Koppers Co., Inc. These furnaces will have an annual output of 1,800,000 tons of raw steel. Two blast furnaces, to be built by Arthur G. McKee, Inc., of Cleveland, will have an annual capacity of 1,200,000 tons of pig iron. To line one furnace, 3,000,000 bricks are required.

In addition to the five main areas, the National Tube Co., a subsidiary of United States Steel, will build a pipe-producing plant at the eastern edge of the tract.

Close to 5,000 persons are expected to be employed at Fairless Works—approximately 4,500 production workers and 500 in supervisory and administrative capacities. Rolling operations at the mill are expected to start early next year before the entire plant is completed. Products will include pipe, sheet steel, bars, plates, and tin plate. Initial annual capacity is expected to consist of cold-rolled sheets—289,000 tons; hot-rolled sheets—235,000 tons; standard pipe—281,000 tons; bar products—285,000 tons; and tin mill products—170,000 tons.

### Contractor Personnel

At the end of the first month of work, the Walsh - Perini - Groves - Slattery joint-venture team had a force of 600 employed on a single shift. It expected to increase this number and add a second shift with the coming of better weather, and as the work progressed.

Key personnel for the general contractor includes H. H. Dugan, Project Manager; J. J. Murphy, Assistant Project Manager; D. D. Bentley, Chief Engineer; Steve Richards, General Superintendent; and J. H. Weidman, Jr., Office Engineer. For C. J. Langenfelder & Son, Inc., John Everhardt is Project Manager and Dick Taylor is Superintendent.

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*Scrap metal is needed again to maintain and increase high steel output. So send in more scrap for more steel.*

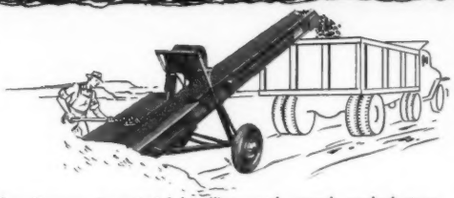
### Tractor Attachments

Pocket-sized folders describing two tractor attachments, a post-hole digger and a grader blade, each designed for wheel-type tractors, are available from Danuser Machine Co., 537-41 E. Third St., Fulton, Mo.

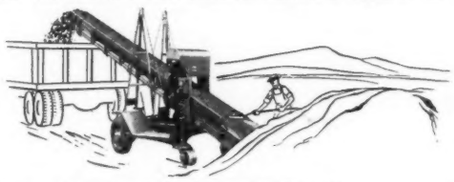
The Danuser Digger is an earth auger for drilling post holes, setting guardrails, seedling setting, etc. Augers with diameters from 4 to 24 inches are available. The Danuser all-purpose blade is designed for terracing, ditching, grading, backfilling, and landscaping work. Both the Digger and the blade may be mounted on Farmall C, H, M, and MD; Case VA, VAI, VAC, S and D; Allis-Chalmers B, C, and WD; John Deere A, B, G, M, and MT; and the Massey-Harris 22; and are also adaptable to the Willys Jeep and the Caterpillar D-2.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 367.


Are You Ready For Those Highway Jobs?



When it comes to material handling—sand, gravel, crushed stone and what have you—the Light Weight Troughed Belt Conveyor, Model 666, will show you efficiency in action. It has a capacity of 75 yds. of sand or gravel per hr. Standard equipment: underslung axle, twin hydraulic boom hoist, slide trough and 14"—4 ply belt. You'll find Model 666 is built for a lifetime of rugged service.



For those heavy-duty stock piling and loading jobs, the Power Moved Heavy-Duty Troughed Belt Conveyor will do a real job. This smooth operating conveyor is equipped with even keel balance, hydraulically operated boom hoist, and hydraulic drive. Extra-heavy construction means maintenance economy and years of top performance.

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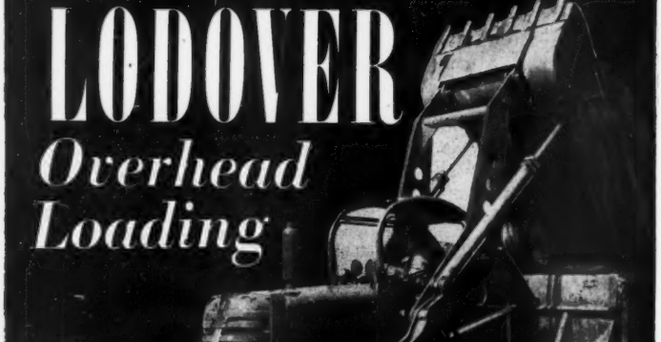
## Catalog on Safety Products

A 44-page catalog on safety clothing and equipment for a variety of working conditions is put out by Safety Clothing & Equipment Co., 7016 Euclid Ave., Cleveland 3, Ohio. The line includes gloves and other hand protection, welders' clothing, sandblast uniforms, safety curtains and blankets, dust hoods, face shields, safety belts, and safety hats. Brief data and an illustration of each of the products are included in the catalog.

This literature may be obtained from the company by requesting Catalog 501, or by using the Request Card at page 16. Circle No. 291.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# Avoid Legal Pitfalls

**Edited by A. L. H. STREET, Attorney-at-Law**

*These brief abstracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.*

## When Is a Contractor Liable For Injury After Job Acceptance?

• A TRAVELER who is injured because of some unsafe condition in a completed job may sometimes hold the contractor liable although the job has been accepted by the state or other public authority. In ruling on such cases the court may be influenced by several factors. Was the job accepted in a legal sense? Was the unsafe condition the fault of the contractor or of the designer? Did the contractor, although he followed contract conditions, break some general rule of law?

In one of the latest authoritative decisions on this subject, the Kansas Supreme Court declared that a state highway contractor who performs his contract "according to plans and specifications, with proper care and skill, is not liable in damages for incidental injuries involved in the performance of such contract after the work required by its terms has been completed and the improvement turned over to and accepted by the Commission." (Tillotson v. Fair, 160 Kan. 81, 159 Pac. 2d 471.)

But some decisions involving the contractor's liability after completing a job have hinged on whether or not the job was, in fact, accepted. A formal acceptance, according to the court, is not required, but there must be evidence of a practical acceptance; that is, such acceptance as will discharge a contractor from responsibility may be shown circumstantially. For example, in the case of Haynes v. Norfolk Bridge & Construction Co. (126 Nebr. 281, 253 N. W. 344), a motorist was fatally injured by driving his car into an uncovered end of a culvert after the contractor had completed his work and withdrawn his equipment, and after the state engineer had examined the work and marked it in his book as 100 per cent complete. This acceptance, declared the Nebraska Supreme Court, was sufficient to free the contractor from liability. The court noted that it was not part of the contractor's job to backfill at that point, although he had thrown dirt over the culvert at the center of the job.

In the case of Trigg v. H. K. Ferguson Co. (209 S. W. 2d 525), the contractor was unable to prove to the Tennessee Court of Appeals, Western District, that his job had been accepted. Acceptance may be shown circumstantially, admitted the court, but, it said, this general rule of law does not imply "that a contractor can rid himself of responsibility by assuming the author-

*(Continued on next page)*


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# Avoid Legal Pitfalls

(Continued from preceding page)

ity to open the road to traffic" after a one-sided declaration that his work is done. In this case a motorist had driven over an embankment at the end of a T-intersection on a section of highway which was part of a vast incomplete Government project. There was no evidence to show that the Government had accepted parts of the job piecemeal.

### Error in Design

Can a contractor be held liable for injuries resulting from an error in design, although the work and the required method of performance are not obviously and inherently dangerous? No, said the New Jersey Court of Errors and Appeals in the case of Lydecker v. Board of Chosen Freeholders of Passaic County (91 N. J. L. 622, 103 Atl. 251). A bicyclist who had been thrown while riding on a recently oiled highway sued the company on the ground that it had negligently created a dangerous condition. The company's contract required that no more than ¼ gallon of oil be spread per square yard. The evidence tended to show that more was spread than was necessary, but it did not appear that contract requirements had been exceeded. The majority verdict held that the work required of the contractor was not inherently dangerous, or obviously liable to create a nuisance. If a nuisance was created, it was a nuisance for which the county alone was responsible, since a contractor cannot be expected to be an insurer of the sufficiency of all specifications for public work.

Six judges, in a dissenting opinion, said that the oil company was liable for negligence in placing an excessive quantity of oil on the highway, regardless of whether the right to do so was granted by the contract, and that its liability rested upon the ordinary duty not to create a nuisance in the highway.

### Danger Not a Result of Design

Some jobs, such as filling culvert excavations, although they may be done in accordance with contract provisions, produce dangerous conditions for which a contractor may be held liable. In an Iowa case, the Supreme Court refused to disturb a jury's finding that a contractor was guilty of actionable negligence in leaving a bump which he admitted was at least 5 inches above the road level, and which plaintiff testified was from one foot to 18 inches above the level. (Kehm v. Dilts, 222 Iowa 826, 270 N. W. 388.) The court said that the contractor "was required to leave the roadway at that point in reasonably safe condition for public travel thereon. His liability accrues, not because of a breach of contract, but for his tort in making the highway dangerous and in failing to guard it." The court's opinion cites decisions to the same effect reached by the Supreme Courts of Minnesota and North Dakota.

In a decision based on a similar principle, the same court held a road contractor liable for an automobile accident caused by a pile of dirt he had left in the traveled way over a culvert. (Grennell v. Cass County, 193 Iowa 697, 187 N. W. 504.) In this case the court said that although an Iowa county is not liable for injuries caused by such accidents, the contractor is not relieved from liability, especially when the contract imposes obligations on the contractor for the safety of travelers on the highway.

However, in other cases similar to the two we have just discussed, contractors have been freed from liability if they fulfilled contract requirements.

In a Texas case, the Texas Commission of Appeals decided that a culvert contractor could not be held liable for an injury to a motorist caused by lack of backfilling, since his contract did not require him to backfill. (T. J. Mansfield Construction Co. v. Gorsline, 288 S. W. 1067.) Road contractors in Washington were not held liable for injury to motorists caused by the absence of barricades at the site of a proposed bridge. The road contractor's job had been finished and accepted, and he had nothing to do with the bridge construction. (Donaldson v. Jones, 61 Pac. 2d 1007.). A decision of the Arkansas Supreme Court in the case of Memphis Asphalt & Paving Co. v. Fleming (96 Ark. 442, 132 S. W. 222), provides an additional example. There a paving company was not held liable for injury to a pedestrian who—because of the absence of guardrails—fell from a sidewalk crossing a depression. The company's contract had not required

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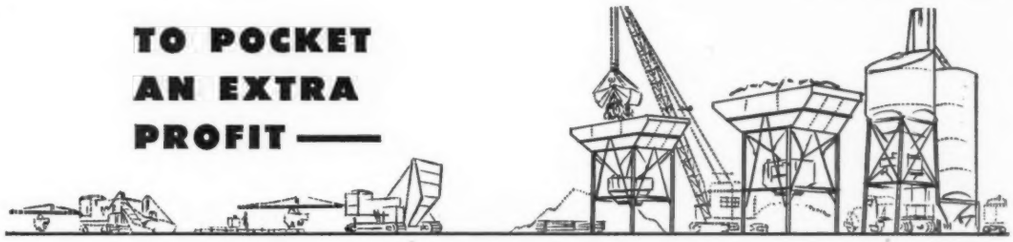

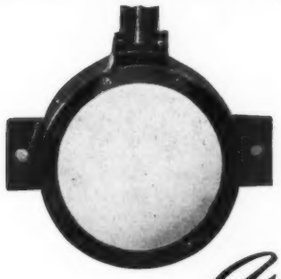

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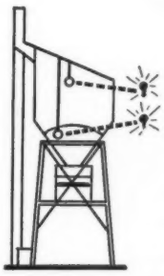
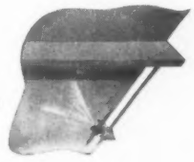


As examples:



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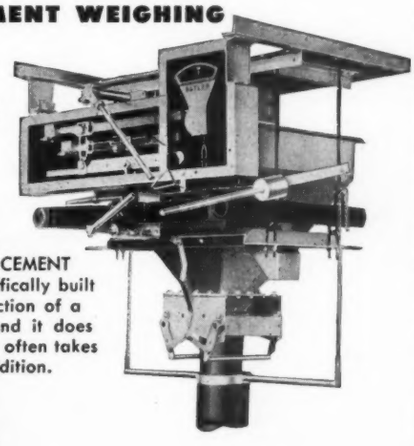
We hope you haven't—but if you have a bulk cement bin made by someone other than BUTLER you can still get the advantage of quick accurate batching by installing a BUTLER CEMENT BATCHER. It's specifically built to match the production of a dual drum paver and it does it so superbly that it often takes care of a 27E in addition.



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BUTLER BIN CO.
951 BLACKSTONE AVE. . WAUKESHA, WIS.

# Avoid Legal Pitfalls

*(Continued from preceding page)*

it to install guardrails.

The following case is one in which liability accrued to a contractor after the acceptance of a job for reasons other than injury to travelers. (Pennsylvania Steel Co. v. Elmore & Hamilton Contracting Co., 175 Fed. 176.) The contracting company, as a subcontractor, failed to observe contract requirements and built defective bridge piers. These piers crumbled under the weight of the superstructure put in place by the steel company. A New York federal judge ruled that, although the job had been accepted, the subcontractor was liable because his work was inherently dangerous.

## Contract Cancellation

One cannot cancel a contract merely because he and the other party cannot agree on what it means. So decided the United States Court of Appeals, Ninth Circuit, in the case of Aitchison v. Anderson, 183 Fed. 2d 922.

But if there is a lawsuit over what the agreement means, and the court cannot determine what the parties intended—even with the aid of the wording, the testimony of the parties, and the surrounding circumstances — the party who attempts to enforce rights under the contract is apt to lose the suit. Obviously, it's not a bad idea for contracting parties to make special effort to state the terms of their agreement so clearly that there can be no reasonable ground for later dispute.

## Trespassing Children— Liability for Injury

THE PROBLEM: *A contracting company stored equipment and material on a vacant lot. A trespassing youngster tried to push a barrel of tar, and a heavy beam that rested on a trailer fell on him. Was the contractor liable?*

THE ANSWER: No. (Petrak v. Cooke Contracting Co., 46 N. W. 2d 574, decided by the Michigan Supreme Court.)

The court said that a reasonably prudent person would not have foreseen that children in the neighborhood would be apt to play with the trailer or that a 24-foot steel beam lying upon it in a diagonal position would cause injury.

The court distinguished this case from one in which it declared that a contractor was liable for an injury a child received from exploding dynamite caps left on a shelf in a tool shed on private premises near a school. (Butrick v. Snyder, 210 N. W. 311.)

The court thought that another of its decisions was more in point—a case where a boy was burned by gasoline which he and playmates had taken from a gasoline work cart left standing on a parkway between a sidewalk and street. The company owning the truck was exonerated from liability on the ground that it was not bound to foresee the theft and ensuing consequences. (LeDuc v. Detroit Edison Co., 235 N. W. 832.)

## Liability of a Lessee For Damaging Equipment

THE PROBLEM: *Defendant, a Government contractor, hired from plaintiff a Caterpillar-propelled bulldozer with operator. When drivers hesitated to obey defendant's direction that the bulldozer be driven over an icy hill, defendant exclaimed, "Ain't there a cat-skinner that can bring that damned cat over?" Finally, plaintiff's driver undertook to drive the machine up the hill slope. Despite careful driving, the cat slipped down the hill and was damaged. Was plaintiff entitled to damages for injury to the equipment and for loss of its use while being repaired?*

THE ANSWER: Yes. (Schultz v. Weber, 44 N. W. 2d 909, decided by the Wisconsin Supreme Court.)

The court followed its reasoning in an earlier case, to this effect: the fact that an operator of equipment is in a limited sense the agent of the owner does not relieve a lessee from liability for negligently inducing the operator to drive into a place of concealed danger.

## Acceptance of Check Barred Further Claim

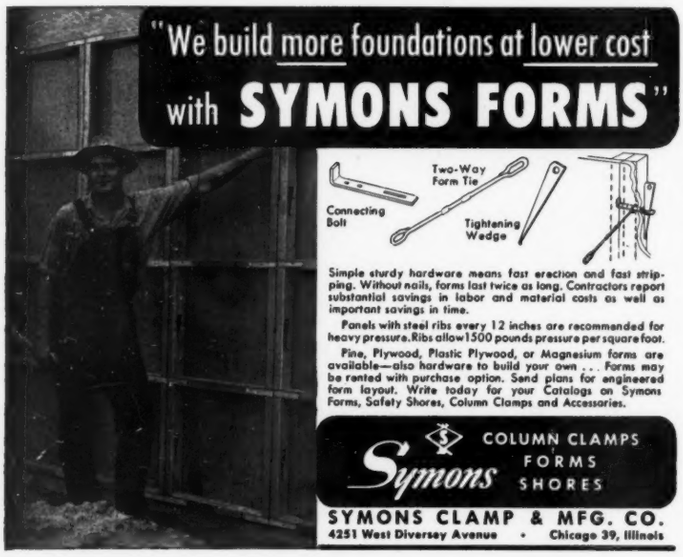
THE PROBLEM: *Municipal-improvement contractors agreed to pay a bonus based on profits to a construction superintendent. They sent him a check for $9,345.01 as full settlement. He retained the check but refused to cash it, under protest that more was due him. An audit showed that $13,047.42 was due and a check for that amount was sent as final settlement on return of the smaller check. The superintendent cashed the larger check, but telegraphed a protest that still more was due. Was he entitled to sue for another audit and more money?*

THE ANSWER: No. (Harvey v. Smith, 63 S. E. 2d 885, decided by the Georgia Supreme Court.) The court said that acceptance and cashing of the larger check amounted to a binding agreement to receive it as final settlement.

## Federal Contractor Held Not Exempt From Local Tax

THE PROBLEM: *A contractor was doing work for the United States in the Virgin Islands. Was he exempt from municipal taxes there, imposed upon gross receipts and articles brought into the Islands, under ordinance provisions exempting agencies of the Government from such taxes?*

THE ANSWER: No. (H. I. Hettinger & Co. v. Municipalities of St. Thomas and St. John and St. Croix, 187 Fed. 2d 774, decided by United States Court of Appeals, Third Circuit.)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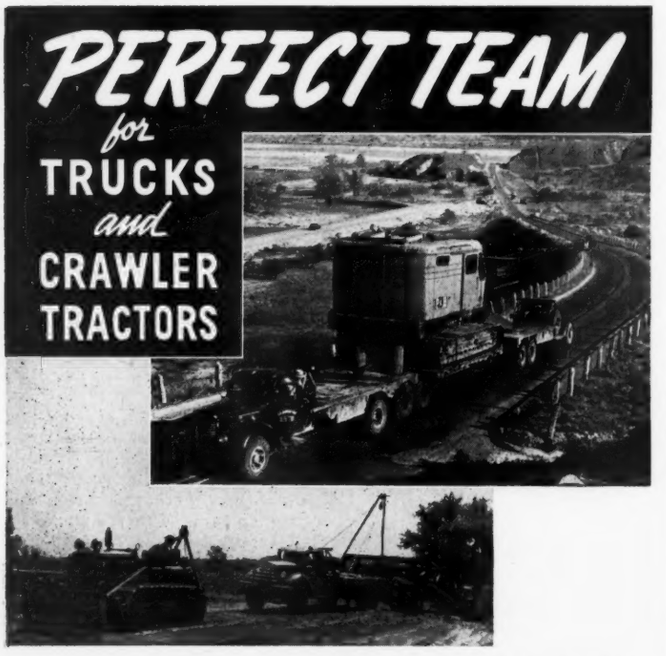


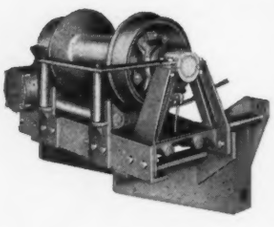

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Use the Request Cards Between Pages 16 & 17 To Obtain Further Information or Printed Matter on Any Product Advertised or Described Editorially in This Issue

Syntron makes this valve for controlling the flow of bulk materials from bins, hoppers, and chutes. It comes in five sizes.

## New Valve Controls Bulk-Material Flow

A valve for controlling the flow of bulk materials from bins, hoppers, and chutes is available from Syntron Co., 227 Lexington, Homer City, Pa. The company reports that the valve may also be used for free air control in heating, ventilating, and drying. It can be readily attached to bin and hopper discharge openings—to supply chutes and ducts—and in air ducts. The fabric diaphragm will withstand hard use and may be replaced, the company says. The valves are available in 5 different sizes to fit diameter openings up to 12 inches.

The valve has a flexible diaphragm which is similar in operation to the iris diaphragm of a camera. In rotating, the control lever increases or decreases the opening of the diaphragm and the flow of material. The company points out that the material passed through the valve does not come into contact with any moving metal parts, so there is no jamming. The diaphragm is made of cotton duck, Nylon, rubber, or other material suitable to the application.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 346.

### Pioneer Personnel

Melvin Ovestrud was elected President of Pioneer Engineering Works, Inc., Minneapolis, Minn., at the annual meeting of the board of directors. Mr. Ovestrud, formerly First Vice President, succeeds Lewis W. Yerk, who has retired as President and General Manager. Eugene C. Bauer, President of Poor & Co., Chicago, was elected Chairman of the board of directors.

Other changes in management personnel include the promotions of K. E. Brunsdale from Vice President to First Vice President; O. J. Ellertson from Treasurer to Vice President, and Carl R. Rolf from Assistant Secretary to Vice President.

## Mesh Reinforcement For Masonry Blocks

A block mesh reinforcement, designed to give additional strength and control in masonry wall construction, is available from The Carter-Waters Corp., 2440 Pennway, Kansas City 8, Mo. Blok-Mesh is said to eliminate stair-step cracking above lintels and beneath sills and to reduce shrinkage cracks.

This product may be used to tie face brick to back-up blocks, for cavity-wall construction, or for double-wall construction. It is made of high-tensile wire rods electrically welded every 16 inches and comes in sizes for use in 4, 6, 8, 10, 12, and 13-inch walls.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 254.

### Scrapers, Graders, Dozers

Four new booklets covering Caterpillar construction equipment and dealer service for preventive maintenance have been offered by Caterpillar Tractor Co., Peoria 8, Ill.

The first is titled "Cat Scrapers Built for Your Job" and describes scraper design, haul features, dozer-type ejection on the fill, spreading, and the open bowl designed for shovel loading. On-the-job photographs show the Caterpillar scraper in a variety of services.

"More than 90 per cent of all motor graders manufactured by Caterpillar Tractor Co. are still at work today" is the claim of the second booklet. It points out that parts and service are readily available for even the oldest machine. It features the research and engineering, the testing and on-the-job experience, and the manufacturing and inspection behind the Caterpillar motor grader.

A broadside on the Caterpillar No. 8SR bulldozer is the third piece of literature offered. Closeup photographs illustrate its working parts while others show its use in the field. Detailed specifications are included.

The last of the bulletins emphasizes the importance of maintaining machinery, and its photos illustrate the service facilities offered by Caterpillar dealers throughout the country.

Each of these booklets may be obtained from the company, or by using the Request Card at page 16. Circle No. 359 for data on the scrapers, No. 360 for graders, No. 361 for the Model 8SR bulldozer, and No. 362 for the description of dealer service.

### Data on Many Types of Hose

A 4-page bulletin on types of hose used in the construction industry has been prepared by Continental Rubber Works, 1902 Liberty St., Erie, Pa. It includes air, water, jet, road, discharge, suction, steam, pile-driving, fuel-oil, and other hose.

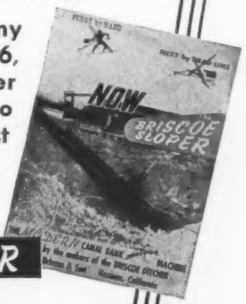
Types for each service are illustrated and described. Cutaway photos show the hose construction. Data on the hose indicate its application, properties, and sizes available.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 308.

THE MODERN CANAL BANK contour MACHINE

Slope your canal banks to any degree wanted – cut back the berm–spread the spoil away from the bank–up to 3 miles per hour.

Quickly attached to any crawler-type tractor of D6, D7 or D8 power. Sloper blade and spoil wing do entire job in a single, fast operation.

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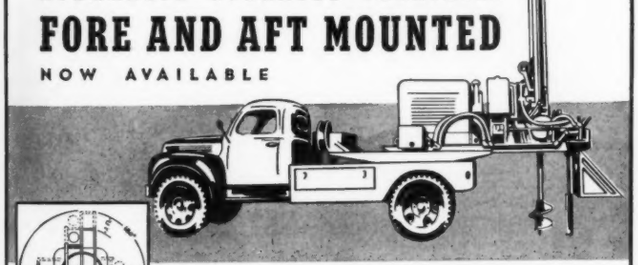

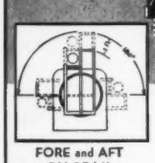

FORE and AFT DIAGRAM

180° rotation plus extention and retraction horizontally for two feet "Fore & Aft" at any point within this travel is made possible through the adaptation of hydraulic power which is the main feature of the STERLING Earth Boring Machine. This mounting is especially valuable in digging holes while the truck is parked along side of the curb in highly congested areas of most of our cities. There is no need to back in to each hole and tie up traffic for any length of time. This feature plus many others which have already been adapted to the STERLING Earth Boring Machine assure you of being able to do your job FASTER, BETTER and CHEAPER. Write for Bulletin "FA" which describes this adaptation in fuller detail.

Wyoming Valley Equipment Company
FORTY FORT, PENNSYLVANIA

STERLING - INDUSTRY'S "ACE IN THE HOLE"

# Machines Road-Mix Secondary Highway

## New Mexico Back Country Gets Bituminous-Mixed Highway as Contractor Pushes Spring Project

• FOR many years the New Mexico State Highway Department has carried on a secondary-roads improvement program designed to improve back-country roads, usually with bituminous surfacing, to riding standards which compare favorably with first-line transcontinentals through The Land of Enchantment.

The year 1951 is no exception, and one such section to be completed was 14½ miles of farm-to-market highway between La Joya and Vequita, about 50 miles south of Albuquerque. Floyd Haake of Santa Fe was the contractor. The work was expected to be finished in late May after only a five-month construction period, at a contract cost of approximately $232,000.

Haake's contract included grading, drainage, production of gravel ballast and leveling-course material, and the road-mixing of a 1½-inch bituminous surface with MC-3 asphalt. Preparation of a single-penetration seal or armor coat was part of the contract.

The old road, if it could be called such, was scarcely more than a single-car trail leading off through the desert. It was dusty in summer, muddy in winter, and rough always. Thus, while the work itself was routine, the job was exceptional; exceptional because the contrast between new and old for slightly over $16,500 a mile, including engineering, is nothing short of miraculous.

### Light Grading

Grading was very light. The new location followed the old pretty much, and with the exception of one short rocky place, only light grading in sandy material was necessary. There was no borrow involved, and since the cuts and fills were balanced around short-haul points, Haake used tractors and scrapers. Three LeTourneau Carryalls with D8's for pulling, and a D8 as a push cat, moved the material. Auxiliary sheepsfoot rollers, a water tank truck, and a D8-mounted dozer completed the picture. Some spreading and bank sloping was done by three No. 12 Caterpillar graders assigned to the job.

One feature stood out about the grading. As the machines finished the subgrade, surveyors set grade stakes and the motor graders dressed the dirt velvet-smooth. New Mexico's construction people learned long ago that no bituminous road-mixed surface is any smoother than the subgrade and subbase on which it is laid. Therefore, the subgrade was worked, rolled, and "tight-bladed" with gentle pressure until it was shaped to even lines. The right-of-way was from 50 to 75 feet wide, and the blades also dressed the slopes to pleasing lines out to those limits.

### One-Pit Aggregate Production

Specifications called for 3 inches of granular ballast for subbase material, and 3 inches of leveling-course material. On the upper 3 inches, the contractor had the option of placing it all at one time and then cutting the upper 1½ inches for the road-mixed cake, or of placing 1½ inches at a time. Haake chose the latter method.

Specifications for ballast course were:

| Size Screen | Per Cent Passing |
|---|---|
| 3-inch | 100 |
| No. 4 | 35–90 |
| No. 10 | 30–70 |
| No. 200 | 5–20 |
| Liquid limit: | 35 or less |
| PI: | 6 or less |
| Dust ratio: | 65 or less |

For the upper 3 inches of leveling-course and road-mix aggregate material, the sizes were as follows:

| | |
|---|---|
| 1-inch square opening | 100 |
| ¾-inch | 85–100 |
| No. 4 | 40–70 |
| No. 10 | 30–55 |
| No. 200 | 5–15 |
| Liquid limit: | 25 or less |
| PI: | 2 to 6 |
| Dust ratio: | 65 or less |

Production of approximately 43,330 tons of ballast and 29,075 tons of leveling-course material was necessary to shape this part of the project. Fortunately, a pit of native material was located in almost the exact center of the work, and one crushing-screening setup could do it all.

Haake used a Diamond screening plant to produce the gravel ballast, while a Pioneer 38-V with a 10 x 36 jaw crusher with 30 x 18 rolls was used to produce the finer material.

Dump trucks hauled the material to the roadway and spread it according to volume and distance. Blades then road-mixed the material thoroughly, and water was added. When the windrow was thoroughly mixed, blended, and waterbound, it was laid out and rolled by rubber-tire rollers.

The first 1½ inches of leveling-course material was treated in exactly the same way. After it was down and smooth, it was ready to receive the bituminous road-mix. No prime coat was called for.

### Gardner Mixer Road-Mixes

The 20-foot bituminous surface was mixed out by a Gardner road-mixing machine, which worked sections about 1,500 feet long at a time. As a rule, three passes were necessary. One of the worst problems was delivery of asphalt. The MC-3 had to be trucked in from Big Spring, Texas, and the long haul made deliveries bad. The transports were well insulated, however, and asphalt which had been pumped at 250 degrees at the refinery reached the job at an application temperature of from 200 to 220 degrees; 5.2 per cent was applied.

Final mixing and aerating was done by the Caterpillar motor graders, after which the material was laid down and rolled by pneumatic and steel-wheel rollers.

The single-penetration seal coat consisted of an application of 0.4 gallon of 210–250-penetration asphaltic cement, and a cover coat of ½-inch-minus chips. These were rolled thoroughly to insure bedding, the excess was broomed off, the shoulders were finally dressed by blades, and presto!—that part of New Mexico had a fine new highway.

The job was supervised under the general direction of B. G. Dwyre, State Highway Engineer, assisted by R. M. Howard. Phil Garland was the Resident Engineer, and B. F. Smith was General Superintendent for the contractor.


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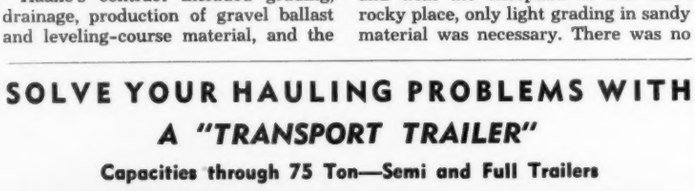

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PATENTED TANDEM AXLE ASSEMBLY—Featuring unusual lengthwise and sidewise wheel accommodation to irregularities in the road. Use of full width tubular forged, heat treated axles with CAMBER.

FRAME—Constructed of beam sections throughout, electric welded. A ruggedly strong and efficient unit with minimum weight.

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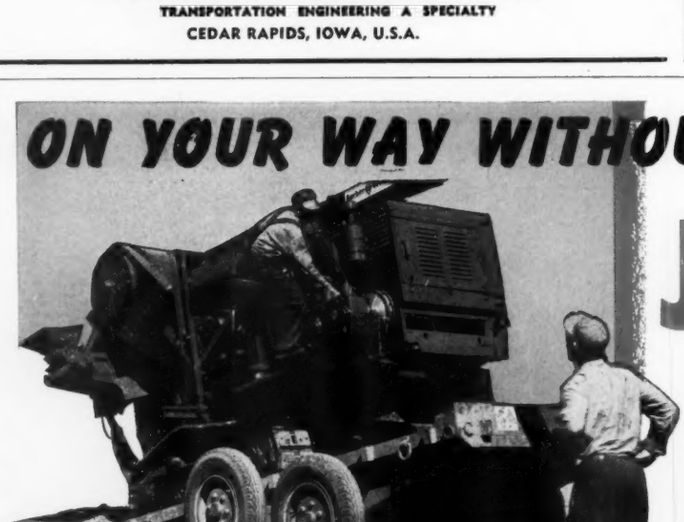

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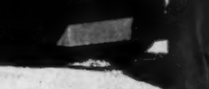
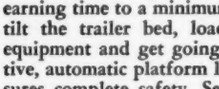
Tandem Axle Trailers



Tandem Axle Tilt Trailers



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FOR: ROAD BUILDERS
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500 lbs.
. . 3,300 lbs.
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Special Release Hooks for Dropping

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Write for prices

FREDERICK IRON & STEEL, INC.
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Frederick, Maryland

This 12-foot chain saw, made by Mall Tool Co., can be used in road work or forest clearance.

## A 12-Foot Chain Saw

One of the largest guide plates and cutting chains ever made for use on power chain saws has been designed by Mall Tool Co., 7740 S. Chicago Ave., Chicago 19, Ill. It is 12 feet long and is made for big cutting jobs. In addition to lumbering operations, the unit can be used in road construction and forest clearance, the company says.

Two men operating this power chain saw can cut 12-foot-diameter timber, eliminating the need for large cutting crews working with hand saws, axes, or smaller power saws. The guide plate is interchangeable and can be quickly detached from the power unit when smaller sizes are desired, Mall says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 283.

## Snow-Melting Systems

A study of 50 snow-melting systems operating in 15 divisions of business and industry has been put in booklet form. The 36-page bulletin titled "Byers Wrought Iron for Snow-Melting Systems" may be obtained from A. M. Byers Co., Clark Bldg., Pittsburgh, Pa.

The bulletin traces the growth of snow-melting systems from the first recorded installation in the United States in 1925 through the hundreds of installations during the past six years. It has 83 illustrations which show systems in operation or as they are being installed. They also show 8 piping layouts for various installations, including loading areas, ramps, sidewalks, driveways, and highways. Chapters are devoted to design, piping properties, the use of antifreeze, paving design and fill, fabrication and installation, installing and operating costs, operating practices, and auxiliary units.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 280.

## Earth-Boring Machine

A folder describing the California earth-boring machine, which will drill 10 to 72-inch holes 200 feet deep, is available from California Welding & Blacksmith Shop, 7222 E. Slauson Ave., Los Angeles 22, Calif. This machine is designed for drilling footing columns, soil testing, well or cesspool drilling, and mineral exploration.

The folder illustrates and describes the drilling unit and gives details on construction features and performance. It points out that the drill rig may be mounted on any size of truck—a 1½-ton chassis is usually chosen. All drilling operations are controlled from a central unit. The bucket, which comes in several sizes, operates from a standard kelly bar 3 inches square and 22 feet long, made of heat-treated alloy steel. The kelly bar is carried by a 32-foot collapsible derrick with a 20-ton capacity in the drilling position. Drive power is obtained from a 100-hp stationary-type gasoline engine.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 268.

## Multipurpose Grease

A bulletin describing Cosmolube, a multipurpose grease, is available from E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa. The feature of a multipurpose grease, the company points out, is that it saves storage space and eliminates misapplication. Cosmolube is said to have a high melting point, excellent low-temperature characteristics, and a tenacious adhesive quality; it will not separate in use or in storage, Houghton points out.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 314.

## Steel Institute Elects

The following officers were re-elected at the Annual Meeting of the board of directors of the American Iron & Steel Institute: President—Walter S. Tower; Vice Presidents—B. F. Fairless, President of United States Steel Corp., and Frank Purnell, Chairman of The Youngstown Sheet & Tube Co.; Secretary—George S. Rose.

Max D. Howell, Vice President and Treasurer of United States Steel Corp., was elected Treasurer. He succeeds Harold L. Hughes who resigned. Charles R. Tyson, President of John A. Roebling's Sons Co., and R. K. Clifford, President of Continental Steel Co., were elected to the board of directors. Henry A. Roemer, Jr., President of Sharon Steel Corp., was elected a director at an earlier meeting.


**The Original and Only**

**"More Power Puller"**

A compact, light weight hand-operated tool for heavy duty use, will cut operation cost, both time and labor. Unexcelled for construction use, moving machinery, handling equipment, rigging, pulling stumps, laying pipe lines and many other uses. Ask your local Dealer for demonstration.

Certain distributor territories available.

Equipped with 20, 30 & 40 ft. of cable
List price $27.75 to $33.80

THE WYETH-SCOTT CO.
Newark, Ohio

**THURMAN PORTABLE TRUCK SCALE**

- Platform Lengths 18, 22, 24 & 30 ft.
- Capacities 20, 25 & 30 Ton

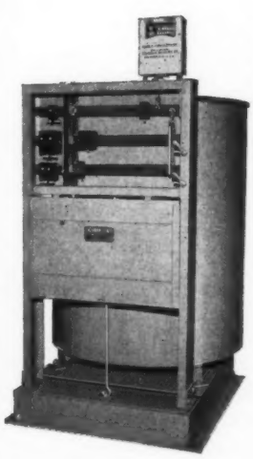
The Scale that can be moved from job to job

Special sizes made to meet special requirements

***Wide Steel Bases***—support scale — require no concrete footings. Easy-to-read chrome plated weighbeam with vital parts electroplated against corrosion.

***Accurate and Portable***—This scale can be transported from job to job by removing 6 nuts which hold side arms in place. The rest of the scale can be lifted as a unit. Once located, it can be readied for use in minutes.

**WATER SCALE**

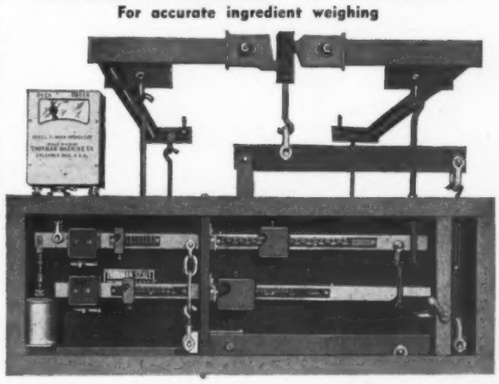


Specifically designed to weigh all types of liquids. Calibrated weighbeams can be read in pounds as well as gallons. Three chrome plated weighbeams include a subtracting beam, a main weighing beam and a fractional beam. The scale is supplied with sensitive electrical or mechanical indicator. Can be furnished with or without tank.

***Write today for additional information on the Thurman Wheelbarrow, warehouse, and pit scales.***

**BATCHER SCALE**

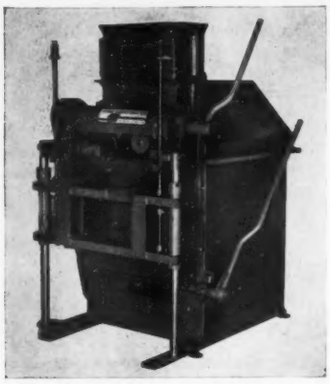
For accurate ingredient weighing



Custom-engineered to your individual needs. The Thurman Batcher Scale can be furnished with any number of ingredient beams calibrated to various capacities, as required.

**THE THURMAN MACHINE CO.—Scale Division**

*156 North Fifth Street* *Established 1918* *Columbus 15, Ohio*



This concrete-block machine made by Flemish Mfg. Co. can be installed in a 30 x 45-inch space.

## New Block Machine

A concrete-block machine for production in small areas has been introduced by Fleming Mfg. Co., Fyler Ave., St. Louis 9, Mo. It can be installed in a 30 x 45-inch space and is designed to produce 100 standard 8 x 8 x 16-inch blocks per hour. A foot button controls the 5,200-rpm vibrator. Hand controls for rotating the mold box and stripping the mold are within arm's reach.

Fleming points out that the height of the blocks may be varied from 2 to 8 inches without additional attachments. The mold-box wear plates, liner plates, and stripper plates are of heat-treated steel and can be reversed for longer use. The protective welded steel housing includes a guard on the vibrator shaft mechanism for added safety. This unit is powered by a 2-hp 3-phase general-purpose motor. A one-phase motor may be used. The heavy-duty vibrators are of all-steel construction and operate with unbalanced shafts connected by two helical square-tooth cut gears to provide balanced vibration. The complete machine with mold box and vibrators weighs approximately 1,030 pounds.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 302.

## Fungus-Proof Decals

Type C and Type G decals manufactured by Meyercord Co., 5323 W. Lake St., Chicago 44, Ill., are now fungus-proof as well as resistant to abrasion, moisture, and temperature extremes. The company claims that the decals are durable and washable; that they are not affected by acid, alkali, alcohol, or petroleum products. A wide line in all sizes, designs, and colors is manufactured by the company.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 332.

## Small Tractor Loader

The High Lift loader is a new teammate for the Mighty Mouse crawler tractor made by Mead Specialties Co., 4114 N. Knox Ave., Chicago 41, Ill. The Model M-6 Mighty Mouse tractor has a 2-speed transmission, a final drive running in oil, a fully shielded bogey carriage, and spring-loaded front idler wheels. Its small size and maneuverability—it can pivot within its own length—and its new attachment enable it to do special jobs and work where larger machines cannot. Rubber treads, the Mott Hammer Knife Mower, a rotary broom, the Tote Wagon, a rotary tiller, and agricultural tools are also available for use with the Model M-6.

The Mighty Mouse, made by Mead Specialties Co., is shown with its new High Lift loader attachment. It can pivot within its own length.

Further information on the new loader may be secured from the company. Or use the Request Card at page 16. Circle No. 282.


MARVEL CONCRETE VIBRATORS

1½ H.P. to 5 H.P.

*The standard with contractors for many years.*

GV-1, GV-2, & GV-3 MODELS NOW EQUIPPED WITH AUTOMATIC CENTRIFUGAL CLUTCH AS STANDARD EQUIPMENT

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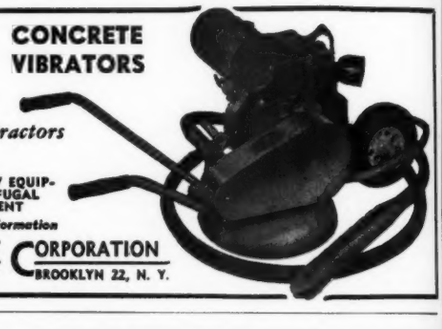
MARVEL EQUIPMENT CORPORATION
215-217 EAGLE STREET BROOKLYN 22, N. Y.



PREVENT PAVEMENT BLOW-UPS

HIGH RECOVERY
WATERPROOF
NON-EXTRUDING
DURABLE
TOUGH
CORKFILL

CORK AND ASPHALT EXPANSION JOINTS

Outstanding joint efficiency—completely free of maintenance problems—and amazingly easy to install are just a few of the reasons why engineers over the nation recommend Corkfill Expansion Joints. W. R. Meadows, Inc., pioneers in asphalt and fibre joints, now introduce this new cork and asphalt composition expansion joint that greatly outperforms other joint materials where resiliency and non-extruding properties are desirable.

Blow-ups, spalling and other pavement maintenance problems are minimized with Corkfill joints. Corkfill has a high recovery of over 85% as against 70% for fibre joints. By comparison it is highly waterproof, light in weight; it has a high tensile strength making it less subject to breakage when installing. Approved by U. S. Engineers and Navy Department as well as under AASHA Specifications M-59, Type VI. Most State Highway Departments accept Corkfill under current fibre joint specifications. Samples and prices are available on request. See your Sealtight Distributor today.

NATIONALLY KNOWN MANUFACTURERS OF SEALTIGHT PRODUCTS

ASPHALT JOINTS
FIBRE JOINTS
TONGUE AND GROOVE JOINTS
DUMMY JOINTS
CONCRETE CURING COMPOUNDS

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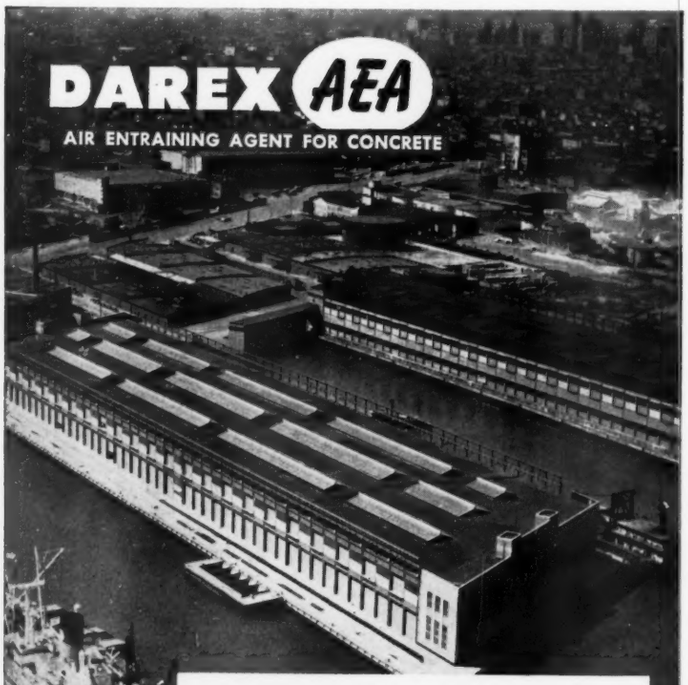
Send for your copy of the popular Sealtight Tech Tip series that describes Corkfill completely. Many other Tech Tips are available for industrial and home construction applications.

DO IT NOW—*Today!*

*For further information write or call*

SEALTIGHT W. R. MEADOWS, INC.
ELGIN • ILLINOIS

DAREX AEA
AIR ENTRAINING AGENT FOR CONCRETE



MOST MODERN PIER
uses most durable concrete

Increased resistance to sea water action! That's one big reason why DAREX AEA concrete was used throughout Philadelphia's magnificent new Pier 80, built by Hughes-Foulkrod Company for the Department of Wharves, Docks and Ferries.

DAREX AEA concrete is doubly durable. It is more impermeable — it resists freezing and thawing. During construction, DAREX AEA places easier with less water, bleeds less, finishes quicker, does a better job on all concrete construction work.

*Cement Products Division*
DEWEY & ALMY Chemical Company
CAMBRIDGE 40, MASSACHUSETTS, CHICAGO 38, MONTREAL 32

AUTOMATIC SAVING IS SURE SAVING . . . . . BUY U. S. DEFENSE BONDS

## Convention Calendar

**August 14-16—Conference on Concrete**
First U. S. Conference on Prestressed Concrete, Massachusetts Institute of Technology, Cambridge, Mass. Professor Myle J. Holley, Jr., Room 1-230, M. I. T., Cambridge 39, Mass.

**August 27-31—Shade Tree Convention**
National Shade Tree Conference Convention, Netherland Plaza Hotel, Cincinnati, Ohio. L. C. Chadwick, Secretary-Treasurer, Department of Horticulture, Ohio State University, Columbus, Ohio.

**October 8-14—Pan American Road Congress**
Fifth Pan American Highway Congress, Lima, Peru. International Road Federation, 550 Washington Bldg., Washington 5, D. C.

**October 22-26—ASCE Annual Convention**
Annual Convention, American Society of Civil Engineers, Hotel Statler, New York, N. Y. Don P. Reynolds, Assistant to the Secretary, 33 W. 39th St., New York 18, N. Y.

## Backs 40-Hour Work Week With 48 the Outside Limit

The National Constructors Association has endorsed maintenance of the 40-hour week with provisions for a uniform maximum of 48 hours for special priority projects. J. F. Pritchard, President of the Association, told the Executive Committee at a recent meeting that the 48-hour week—worked on the basis of six 8-hour days—is the maximum period which can be worked with any degree of economy. When the work-week is further increased, efficiency goes down and costs go up, he said.

The Association condemned the practice of offering excessive amounts of overtime as an inducement for employment. Such a practice, it noted, when connected with the preparedness program, costs the taxpayers money and injures privately financed construction.

The maintenance of the 40-hour week on nonemergency projects, the Association said, would save the taxpayers millions of dollars, make possible a greater output per man-hour of work, distribute labor more equitably, and help in the over-all fight against rising costs and inflation.

## Contractor for Disaster Help

If fire, flood, windstorm, snow, or enemy action should wreak havoc on Thew Shovel Co. plants in Lorain and Elyria, Ohio, emergency manpower and equipment will be forthcoming from Griffith Trucking Co. of Lorain. The contractor has been put on a retaining basis to supply such help.

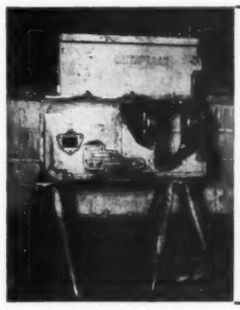
Griffith will make available bulldozers, tractors with snow blades, trucks, shovel loaders, graders, pumps and hose, and asbestos suits. His men will open roadways for Thew, remove debris, rescue equipment and men from damaged buildings, etc.

Thew decided to contract with an outside source for such service after two heavy snowstorms last winter completely swamped its own facilities, and Griffith dug the plant out from under in record time. The emergencies led to the formal contracting for prior rights to Griffith's equipment and personnel in the event of future disasters. It's good business from Thew's point of view, since it removes the burden of supporting idle equipment between emergencies and provides trained manpower.

## Masonry Contracting Firm Traces Fifty-Year History

To mark its golden anniversary, William A. Rainey & Son, masonry contractor, 323 Clementina St., San Francisco 3, Calif., has prepared a booklet illustrating the progress which the company and the masonry industry have made in the past 50 years.

"Fifty Years of Fine Masonry" details the half-dozen material and installation techniques pioneered by the firm. It points up the striking contrasts between brickwork now and a half century ago. When the firm was founded, the booklet points out, bricklayers received $5.00 a day for an 8-hour day. Currently they receive $3.25 an hour. Common brick used to sell for $5.00 a thousand; today's prices are nearly eight times that amount.

GUTH . . . *rebuilds diesel castings*

guaranteed to be equal to, or better than, new castings! Popular cylinder heads for exchange shipments are available for immediate delivery.

GUTH COMPANY McPHERSON, KANSAS

WRITE FOR CIRCULAR

SERVING THE NATION FROM ITS CENTER

WRITE FOR ADDRESS OF NEAREST DEALER

NO TIME LOST!
LOADING OR LAYING ITS LOAD

A STANDARD STEEL PRESSURE DISTRIBUTOR GIVES EQUAL CIRCULATION THROUGHOUT THE SPRAY BAR FOR A UNIFORM SURFACE FROM CURB TO CURB FOR LONGER WEAR

STANDARD STEEL
PRESSURE DISTRIBUTOR

The Model 424 can be loaded in quick time for a "fast getaway". A two-way cleaning system guarantees a clean spray bar at the end of the day. First, the material is sucked out of the bar and back into the tank. Then by turning one small valve, cleaning solvent is released into pump and spray bar (without contaminating the asphalt in the tank). No time lost in tinkering — no time lost in loading — Standard Steel 424 keeps going all day long far ahead of the "gravel gang"

WRITE FOR CATALOG 424

OTHER PRODUCTS OF STANDARD STEEL

Maintenance Distributors, Tar Kettles, Patch Rollers, Supply Tanks, Tool Heaters, Asphalt Tools, Street Flushers, Construction Brooms.

Built to the Highest Standard PD-1

Standard Steel Works NORTH KANSAS CITY, MO.

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can Take It!

Deep Penetration— Proper Balance. Specially curved shells close with maximum leverage—"A Mouthful at Every Bite!"

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Rapid Bucket Opening— Interior shell surfaces, properly curved and free from obstructions, assure fast, complete discharge of all materials.

"A mouthful at every bite"

Buckets AND Grapples
Write for Catalog

THE OWEN BUCKET CO.
Breakwater Avenue • Cleveland, Ohio
Branches: New York; Philadelphia; Chicago; Berkeley, Calif.

## New Machines Scarce, So Cherish the Old

(*Continued from page 3*)

when operating. After you've finished the swing test, raise the boom a few feet (proportionately more at longer radii) to give extra stability.

Be sure your crane is reeved up with the parts of line recommended for the load. In making heavy lifts, don't lift higher than necessary. And when lowering them, slip the brake slowly so it always has complete control of the load. Don't drop the load and then try to catch it by applying the brakes. That's hard on Old Gertie's frame and heart—on New Susie's, too, for that matter—and you might "lose" the load or overturn the crane or both.

It hardly seems necessary to add: know your machine's capacity. You may be lucky, and overloading *may* not end in breakage or an accident. But it certainly increases wear and cuts short the life of a machine.

When it comes to digging, a strong steady pull accomplishes the most work with the least wear. It's foolish—and in the long run, costly—to rush and press. Don't try to move mountains in one dipperful. Strike the proper combination of cutting depth and height, and stick to it. Take a relatively thin slice at a cut in hard digging so the shovel dipper hoists through the bank fast and easily. In soft digging, it isn't necessary to pull the dipper through the full length of the bank to fill it; in high banks of soft digging take top passes first. Move in and clean up the cut, loosen hard material, while waiting for trucks.

Similar do's and don't's save wear and tear in dragline operation. Don't pull the bucket any further than necessary if you want it and your cables to last. The bucket should come down into the pit with all lines taut, and bucket and load should be picked up as nearly as possible under the boom point. It's bad practice to dig close to the fairlead and to pile up too much dirt immediately ahead of the machine; you're only piling up wear and trouble for your drag rope. If necessary, step the dragline back and dig off the top edge of the bank if it threatens to cut the drag rope.

And don't bang the bucket against a bank or a truck or a bin to knock out sticky mud. That's murder! The same goes for a shovel dipper. Don't strike the boom with it, or the hauling unit. Don't jolt it against the tread belts. Don't shake it too much. And your shovel isn't a broom; don't sweep it sideways in cuts to level off; that's hard on boom, dipper stick, and dipper, and if the dipper strikes a solid object, the shock whips back through the whole machine. Keep bucket teeth sharp and built up to increase digging speed and prevent wear on the bucket lip.

You can add years to your rig's life by traveling it in the "approved" way. For instance, snub crane loads to the turntable during travel, to keep them from swinging out and toppling the machine. Don't travel with the boom at a high angle. On short moves, a crawler's drive-end may be pointed in the direction of travel. But on long moves, keep its take-up end pointing in the direction of travel. That way the tread belts are taut on the bottom, driving power is transferred most effectively, and there is the least wear on driving rollers and treads.

Tire inflation is important when working on rubber without outriggers—and in travel. Always double-clutch when shifting transmission gears, and always keep the carrier engine idling at enough speed to charge the battery. Throttle the engine down to idle speed before turning off the ignition switch. Use air brakes to stop self-propelled units, but hand brakes to hold them when parking. Also, block the wheels if you're on a grade.

All these injunctions may seem like tremendous trifles. But remember it isn't a question of banging a bucket once or overloading once. Operators who are allowed to do it once will do it again and again, until strains mount and old age comes upon the rig prematurely, and there you'll be—minus a shovel or crane, and waiting in a long line for another.

So train your operators to use, not abuse, your machines. What's more, make them personally responsible for spotting trouble before it really develops. A new sound? A new vibration? A loose part? A strange feel in the machine's response? The operator is the man to spot these symptoms of trouble. Encourage him to do so and to report them at once.

### Cleanliness Next to Godliness

Now a machine properly worked does the most efficient job, the safest job, and therefore the least expensive job. It will be with you the longest. But it needs some attention in between its exertions, too.

In the first place, it needs to be kept clean and well painted. Not just so it will look "pretty"—though an operator is proud of a good-looking rig, and what he's proud of he will treat with respect. But because dirt hides trouble

(*Continued on next page*)

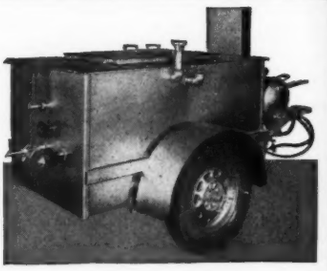

**White Oil-Jacketed Kettles for Heating Elastic Joint Filler**

Joint-filling compounds containing rubber for elasticity, must have indirect heat application. They melt at 375° and must not exceed 425°. White Model F-10 kettles maintain this temperature accurately by oil jacket which transfers heat to the compound. White kerosene burners are safe, dependable, easily controlled. Hand operated agitator. Insulated housing. Other kettles for paving maintenance have FIRE-PROOF tops. Hand or engine sprayers. Several sizes.

*Write for Circular*

White Mfg. Co.

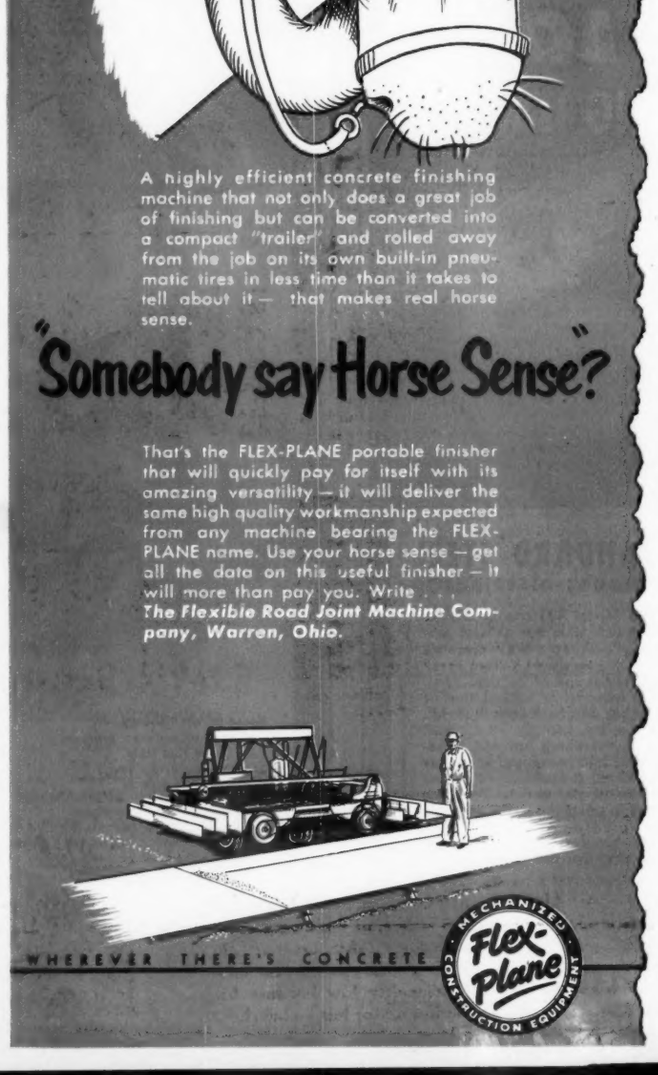
Elkhart Indiana



*Other Products*

ASPHALT PLANTS
CONCRETE VIBRATORS
TRACTOR LOADERS
KEROSENE TORCHES




A highly efficient concrete finishing machine that not only does a great job of finishing but can be converted into a compact "trailer" and rolled away from the job on its own built-in pneumatic tires in less time than it takes to tell about it — that makes real horse sense.
"Somebody say Horse Sense"?
That's the FLEX-PLANE portable finisher that will quickly pay for itself with its amazing versatility — it will deliver the same high quality workmanship expected from any machine bearing the FLEX-PLANE name. Use your horse sense — get all the data on this useful finisher — it will more than pay you. Write . . .
The Flexible Road Joint Machine Company, Warren, Ohio.
WHEREVER THERE'S CONCRETE
MECHANIZED CONSTRUCTION EQUIPMENT
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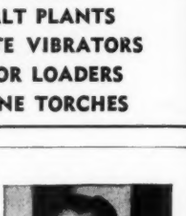

**"Is it too late, Doctor?"**

It's *not* too late for Americans who go to their doctors at the *first sign* of any one of cancer's 7 danger signals: (1) any sore that does not heal (2) a lump or thickening, in the breast or elsewhere (3) unusual bleeding or discharge (4) any change in a wart or mole (5) persistent indigestion or difficulty in swallowing (6) persistent hoarseness or cough (7) any change in normal bowel habits.

Guard yourself against cancer. Phone the nearest office of the American Cancer Society or simply write to "Cancer."

*American Cancer Society*



**Cancer Can Strike Anyone**

Give and keep giving to conquer cancer. Every dime helps teach new thousands how to recognize cancer and what to do about it. Every quarter helps support research scientists seeking the cause and cure. Every dollar helps provide facilities for treatment and care.

"CANCER," Local Post Office

GENTLEMEN: Here's my $..... to help fight cancer.

Name .....

Address .....

City ..... Zone .... State .....

in the making, slows inspection, and plays havoc with bearings when it gets mixed with water or grease.

It is good maintenance to clean a machine generally every eight hours. It is wise maintenance to steam-clean it every six months of operation.

Its fuel should be good fuel—and clean fuel. That's where dustproof fuel storage pays off. Its radiator water should be clean—and its lubricants.

### Oil Cheaper Than Parts

Everyone knows about lubrication, the cheapest repair that can be purchased. But here are a few reminders.

Keep it regular, every so many operating hours. (Do you maintain an accurate log of operating hours for all your machines—or do you rely on your mechanic's hunches?) Establish a definite interval in the day's work schedule during which the machine is shut down and lubricated thoroughly. Make one person responsible for this daily routine.

Use lubricants and motor oils that the equipment manufacturer recommends, in the quantity and grade he recommends, in the spots he recommends. (Remember his handbook we plugged earlier? Well, it includes lubrication charts meant to be used.) And purchase good lubricants from reputable producers.

Too much grease can do as much damage as too little, so don't try to stretch the intervals between lubrication by overusing the grease gun on one application.

Wipe grease fitting *before* and *after* application. That will keep any dirt missed during cleaning out of the bearings and bushings; it will also get rid of the spillage that attracts dirt.

### Inspection, Detection

Like a human being, a machine needs a periodic physical checkup by a qualified, responsible physician. And for the same reason—to find the little forerunners of great mishaps. When a shovel, crane, or dragline is shut down unexpectedly for repair, the chances are that inspection and maintenance were inadequate. Every-day or every-shift inspection is not excessive for large excavators doing heavy work.

Without going into details of 4-hour, 8-hour, 64-hour, or 256-hour maintenance routine (which are better covered anyway in the manufacturer's handbook we keep harping on) here, at least, are some of the danger spots manufacturers single out.

All chains should be properly taut and well greased. Drive roller chains that are too loose drag on the frame wear plates; if too tight, they cause excessive wear on drive rollers and other drive mechanisms. Tread belts that are too tight increase wear on tread pins and shoes; if too loose, they drag on the frame. They should be checked and adjusted in one operation—first the drive chain then the tread belt.

Brakes and clutches should, of course, be kept in proper adjustment and should receive regular inspection for wear. Linings need extra-close scrutiny to eliminate scoring of drums. Center pins should be checked and tightened if necessary. Bushing wear needs to be watched to prevent shaft scoring. All bolts, nuts, and screws should be tightened and reset periodically—or replaced when they have been lost. To safeguard the power plant, engine filters need changing at regular specified intervals.

A small but important item is the grease tube. If these tubes fail, and go undetected, grease may be pumped uselessly all over the ground or the machine, until some bearing fails for lack of grease. Keep your eye on them.

Booms and sticks need checking for cracks or any small imperfections that may mean failure under load. Make sure the saddle block has not worn loose. Watch bushings on the shipper shaft. Check the adjustment of the crowd chain which drives the dipper stick. Watch for wear in buckets and dipper teeth. If it goes too far, salvage will be impossible. And concentrate on cables.

Sheave and drum grooves are crucial to cable life. When they become corrugated or worn and start pinching the rope, don't put off regrooving. And watch sheave bearings. Bad ones may

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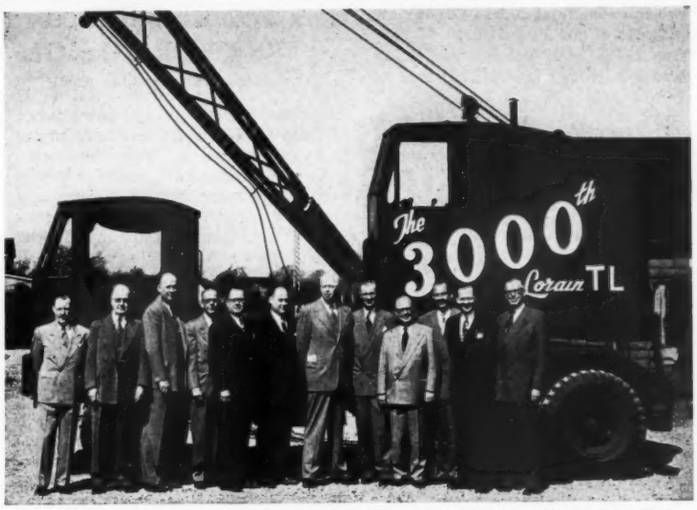


**One of the reasons new construction equipment may be scarce in coming months. This 3,000th Lorain TL, ready for the Corps of Engineers, is part of the Thew Shovel Co.'s $19,000,000 worth of Armed Forces orders. Here Thew officials speed it on its way.**


CP Hicycle Saws have 55° bevel adjustment for angle cuts; blade speed won't sag . . . reserve power makes heavy cuts easy, blades require fewer sharpenings or replacements.

CP Hicycle Vibrator can be used anywhere within a 400-foot radius without moving generator. The motor is in the vibrator head—no flexible shafting is used. Vibrating frequency 10,000 V.P.M.

CP Hicycle Wire Brush Machine, also used for grinding and sanding.

HICYCLE ELECTRIC TOOLS for

HEAVY-DUTY SERVICE

with low maintenance

Developed to meet heavy industry's production line demands for continuous service on a three-shift basis, CP HICYCLE ELECTRIC TOOLS are equally efficient and economical on construction jobs.

They operate on 180-cycle, 3-phase, 220-volt current, and are powered by a light, inexpensive, gasoline-driven portable generator, which can be carried easily from one location to another by one man.

More powerful and more rugged than ordinary electric tools, HICYCLE TOOLS maintain speed under load. Maintenance is remarkably low because high speed, squirrel cage induction motor has no brushes to replace, no armature to burn out.

DRILLS — GRINDERS
WOODBORERS — SANDERS
NUT RUNNERS — CONCRETE VIBRATORS
CIRCULAR HAND SAWS — EXHAUST VENTILATORS

*Write for detailed information.*

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General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

DRILLING CONTRACTORS
Diamond and Shot Core Borings
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Grout Holes and Pressure Grouting
Foundation Testing for Bridges, Dams and all Heavy Structures
also
Manufacturers of Diamond and Shot Core Drills, Accessories & Equipment
SPRAGUE & HENWOOD, Inc.
Dept. C, Scranton 2, Pa.

### Correction

"Computing Stresses in Rigid Frame buildings", a book published by the Lefax Publishers, Philadelphia 7, Pa., costs $1.00. It is not available free as we mistakenly stated in the review on page 19 of our June issue.

The 1951 Lefax catalog containing over 2,000 listings is available free of charge.


WINSLOW—PORTABLE TRUCK SCALE
"THE CONTRACTORS' SPECIAL SCALE"

For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site.
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STULZ-SICKLES CO. SOLE PRODUCERS 91 N. J. Railroad Ave. Newark 5, New Jersey


## New Machines Scarce, So Cherish the Old

(*Continued from preceding page*)

make the sheave stick and throw it out of true. Cables won't last long under those conditions.

As for the rope itself, look for breaks and for reduced diameter especially around the drum and sheaves, at sockets, clips, and other fastenings. In the case of the closing rope on a clamshell bucket, the short section that operates over the closing sheaves gets the most punishment. The tagline section that suffers the most abuse is between the bucket and the guide sheave on the boom. Don't forget that wire rope, though internally lubricated during manufacture, needs more lube after it has been in service for a while, especially where it is exposed to rain, wind, and dust. Frequent but small doses are the rule here. It is good practice to remove ropes from cranes after a definite period of service. The proper length of service can only be established by regular inspections.

Finally, when rig assemblies are taken apart, all keys, pins, seals, and other small items should be marked so they will go back in the same place in the same position—if you don't want reassembly to do more damage than the original disorder. A little mechanic's chalk may save hours of guesswork. While the assembly is apart, incidentally, check adjacent and related assemblies for wear. They are more accessible then.

#### Anticipate Your Needs

A clean, well lubricated, regularly inspected, and properly operated machine will rarely be down for major repairs. But there will come a time when it is aching for a new part. Sad to relate, that part won't be very much easier to come by these days than a whole new machine—unless you've anticipated your needs. If your inspection program is adequate, you *can* anticipate. You can know ahead of time what parts or materials you will need. You can order them before the trouble becomes acute, and give the supplier enough time to get them to you. You won't need to depend on patching and baling wire. But if there was no inspection program to warn you . . . well, the downtime for that rig may be long and costly, and your work schedule thoroughly gummed up.

Here are some suggestions for reducing downtime.

Determine the extent of the overhaul in detail. Make the estimate as nearly perfect as possible so you won't have to follow the original parts order with another, later order when the repair job gets under way. The sooner your order is in, the sooner you'll receive shipping dates. And you'd better wait until all the material is at hand before you disassemble your machine; sometimes a small item out of a large order will be delayed and tie up the whole job.

Explore local facilities for the job to be done. If they prove inadequate, it may still be possible to improvise. At least you'll know that the job will take longer than originally planned. It may be practical to move the machine itself near the proper facilities.

Under today's conditions, consider rebuilding parts whenever possible. Track sprockets, rollers, and shoes can all be rebuilt with hard-surfacing rod. Bores that have been worn oversize should be welded and rebored to standard size. Shafting, depending on its application, can sometimes be metal-sprayed satisfactorily; though where possible, a plating process should be used to salvage shafts.

#### Eternal Vigilance

So, you see, you *can* stay in business even with new machines scarcer than hen's teeth. Just take care of the machines you have by exercising eternal vigilance backed up with common sense, forethought, the grease gun, and the repair kit. That's all preventive maintenance ever took. It just takes more of it today.

## Rubber-Roads Booklet

The booklet "Stretching Highway Dollars With Rubber Roads" has been brought up to date by Harry K. Fisher, Consultant to the Natural Rubber Bureau, and issued in a new edition. It describes the methods of adding rubber powder to asphalt and gives an account of tests which the Natural Rubber Bureau has conducted in the last two years. The tests indicate that when rubber powder is added to asphalt, elasticity is increased and the susceptibility to temperature variation is reduced. The booklet contains on-the-job photographs and pertinent statistics.

Rubber roads have been laid in several Canadian provinces and in Arkansas, Connecticut, Florida, Georgia, Ohio, Maryland, Massachusetts, Minnesota, Missouri, New York, Texas, Virginia, and Wisconsin.

Copies of this booklet are available without charge from the Natural Rubber Bureau, 1631 K St., N. W., Washington, D. C.

## Steel Drafting Tables

An illustrated catalog sheet covering steel drafting tables is available from Stacor Equipment Corp., 1891 Atlantic Ave., Brooklyn 33, N. Y. The Stacor 4-post drafting table is available with one shallow and one tool drawer, with tool drawer only, or without drawers. All models, in hard-baked grey enamel finish, have a steel 4-post base, a steel foot rest, and two steel adjustment devices. Tops are of selected smooth-finish kiln-dried soft wood. The table board adjusts to any angle from horizontal to vertical.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 354.

## Zino Joins Dixon Crucible

Anthony J. Zino, Jr., has joined Joseph Dixon Crucible Co., Jersey City, N. J., as Domestic General Sales Manager. He was formerly Assistant to the President of Swan-Finch Oil Corp.


Concrete Pipe Machinery Co.
MODEL "T" BELL-UP "McCRACKEN" MACHINE

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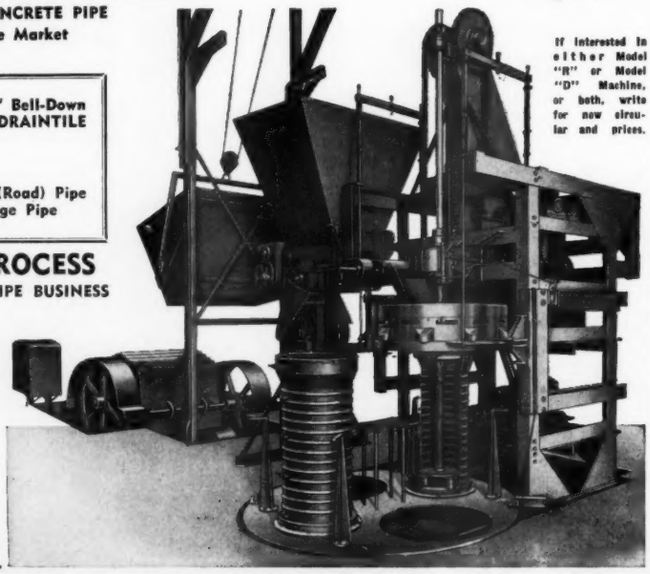

If interested in either Model "R" or Model "D" Machine, or both, write for new circular and prices.

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Concrete Pipe Machinery Co.
Cable Address: Macpipe
EXPORT OFFICE P. O. Box 252 Pleasantville, N. Y.
MAIN OFFICE Sioux City (17) Iowa, U.S.A.

## Data on 24-Hour Concrete

Lumnite, a calcium aluminate cement, can be used for making concrete which has full service strength in less than 24 hours, according to a bulletin prepared by the Lumnite Division of Universal Atlas Cement Co., 100 Park Ave., New York 17, N. Y. The 20-page booklet points out that with Lumnite, strong, durable concrete can be made in freezing weather, overnight, with little or no protection and without using artificial heat.

Lumnite is a hydraulic cement which will set and harden when mixed with water. Footings and foundations of Lumnite concrete can take their full load the day after the concrete is placed, the company says. Floor surfaces are ready for use one day after the floor is finished.

The booklet explains the properties and characteristics of this 24-hour concrete; methods of mixing, placing, and curing; and its application. Charts indicate that a 1 : 2 : 4 Lumnite concrete with 6 gallons of water per bag will have a strength of approximately 3,500 psi in one day, 4,000 psi in seven days, and 6,000 psi in one year. Graps compare the gain strength of Lumnite concrete with that of portland-cement concrete. The literature discusses the use of Lumnite for transit-mix concrete, industrial maintenance, concrete floors, mortar, grouting, and Gunite work. Photographs illustrate applications.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 306.

## Kennametal News

Kennametal Inc., Latrobe, Pa., manufacturer of cemented carbide tools, has appointed two application engineers, Gordon Kimball and F. O. Hill. Mr. Kimball will work in the Springfield, Mass., office and Mr. Hill in Cleveland.

## Data on Tractor Backhoe

The Henry backhoe, an attachment for many standard wheel-type tractors, is described in a circular put out by Henry Mfg. Co., Inc., P. O. Box 720, Topeka, Kans. It has a digging depth of 7 feet and a maximum reach of 11 feet. Bucket widths of 12 to 18 inches are available. The boom may be swung 60 degrees to either side of center. Other specifications, and illustrations of the unit in action, are included in the circular.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 260.

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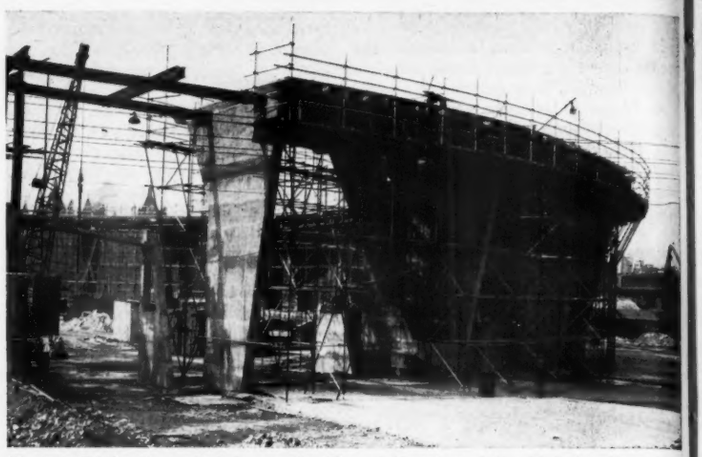
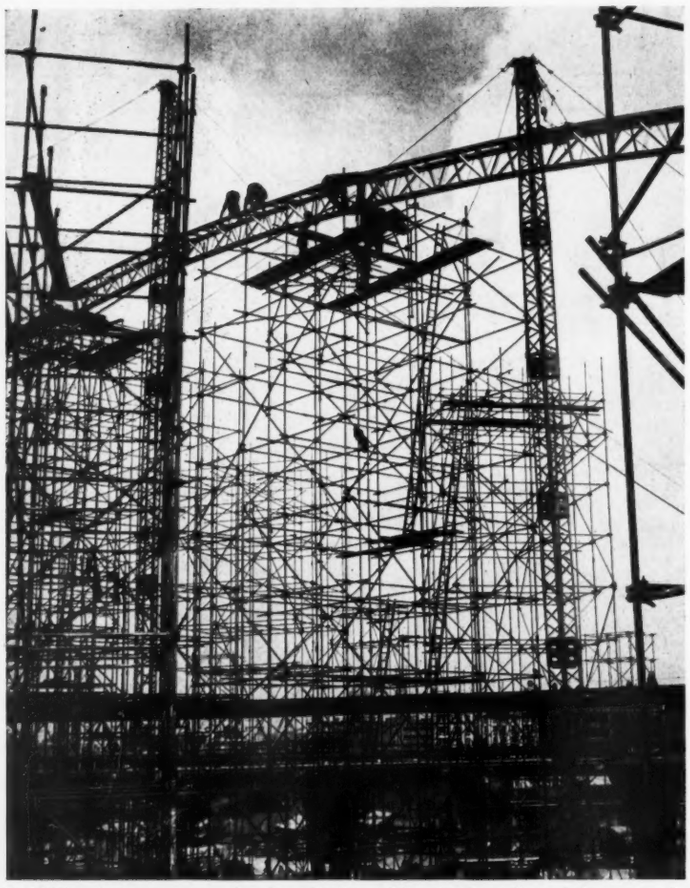
Reinforced-concrete buttresses support the 35-foot gallery on the Dome of Discovery Building—and on them are built the inner and outer skins of a drum wall.



Here scaffolding is erected for construction of the edge of the 35-foot gallery. The other two galleries are 22 and 12 feet high and are supported on a steel framework.



Scaffolding towers were erected beneath the points of intersection of the main ribs of the dome and the ribs were raised into position.

# Aluminum Dome Is Biggest Ever Raised

## Tops Exhibit Building at Festival of Britain; Designed on Principle of Great Circles Crossing in Three Directions

By EDMUND UPDALE, Universal Trade Press Syndicate Correspondent, London, England

• CENTERPIECE of this year's Festival of Britain in London is the Dome of Discovery Building, which houses an exhibit of Britain's endeavors in discovery and exploration—on land and sea, and in science, biology, and astronomy. The aluminum dome of the structure on the south bank of the Thames is 365 feet in diameter and its apex is 93 feet from the ground. It is the biggest dome ever raised.

Architect Ralph Tubbs, Associate of the Royal Institute of British Architects, stressed contrast in his design—contrast between three massive, internal, horizontal galleries of reinforced concrete and a light aluminum saucer dome spanning out and beyond the galleries and supported on light tubular-steel struts. He also conceived of cutting the inverted aluminum cone at an angle to give a basic design of two concentric circles.

### Galleries

Reinforced-concrete fins or buttresses support the 35-foot gallery. They are 15 inches thick, and their narrowed bases give a cantilever of 11½ feet on the front edge and 7 feet at the back.

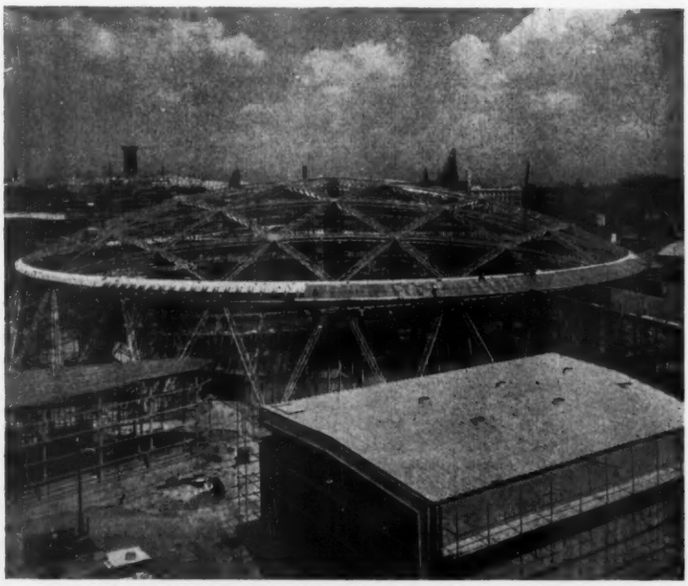
The two other galleries are 22 and 12 feet high and are supported on a steel framework. Wherever possible, the floors of all three galleries were built of precast-concrete slabs. This speeded construction and will speed demolition when the exhibition is over.

### Drum Wall

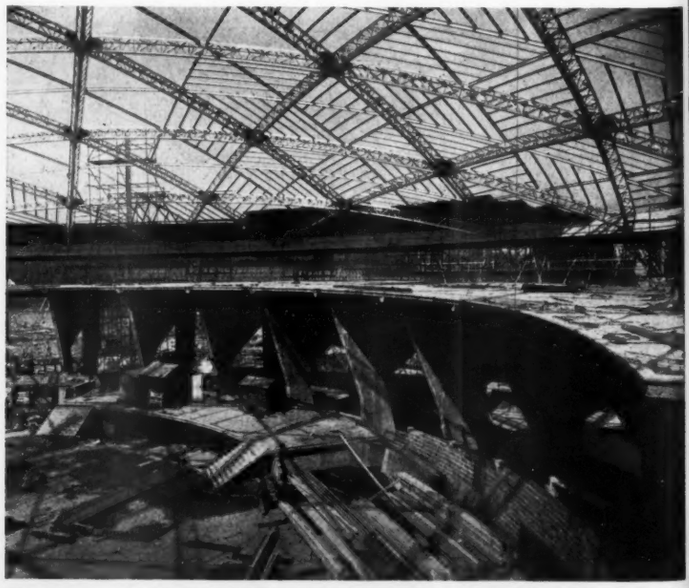
The buttresses are linked by the inner and outer skins of a drum wall which surrounds the inner concentric circle of the design. The top of this wall is defined by its intersection with the inverted aluminum cone. As the cylinder formed by the wall is eccentric with the vertical axis of the cone, the top of the drum wall is much higher on one side. It forms a vast, sloping ellipse 40 feet 5 inches high at its highest point and 8½ feet at its lowest point. Its outer face is battered to a slope of 1 in 4, so it is of considerable width at the base and there is plenty of room there for all building services, plus a number of emergency escape

*(Continued on next page)*

*Festival of Britain Photos*



Here you can see the tubular struts which support the ring girder and form a continuous row of triangles around the structure. The dome is ready for sheeting.



The interior of the dome just prior to sheeting, showing also details of the drum-wall construction. Most of the building services are within the wall.

*Festival of Britain Photo*

**The aluminum sheets on the dome are riveted with aluminum rivets. They are lap-jointed and sealed with mastic.**

*Festival of Britain Photo*

**The completed Dome of Discovery is 365 feet in diameter and 93 feet high from its apex to the ground. The building exhibits tell the story of Britain's endeavors in discovery and exploration.**

stairs.

At the top of the wall are a series of ventilating chambers with inlet fans and filters, for the dome is without windows. There are extract fans in the sloping apron of the aluminum cone.

### Design of Dome

The domed roof consists of built-up ribs, intermediate rafters, purlins, and sheeting—all of aluminum alloy. The whole of the dome is supported on a mild-steel circular ring girder. The girder itself is supported by diagonal struts of tubular steel rising 45 feet above ground level.

The general arrangement of the main ribs is based on great circles passing across the dome in three main directions, forming an over-all triangulated pattern. The practical value of using great circles—a circle on the surface of a sphere which has as its center the center of the sphere—is that the curvature of the top of the rib is always struck from the same radius.

These main ribs, each a single great circle, are of light lattice construction, triangular in cross section and 2 feet 10 inches deep. Their fabrication was relatively simple. However, since it is not possible geometrically for all the ribs to be continuously the same great circle, the subsidiary ribs are formed on three arcs, each part of a different great circle. They were shop-fabricated in single lengths of about 50 feet, with their connections left blank to be drilled through at the site and reamed from the gussets, after the great-circle ribs had been erected.

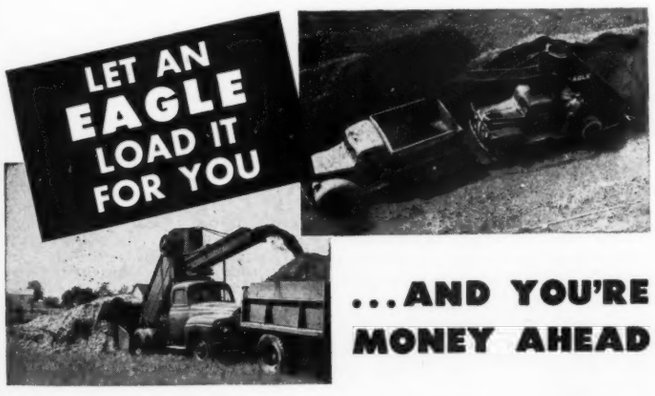
The intermediate rafters have an average span between the ribs of 25 feet and are of joist section, 7 inches deep with 4¾-inch flanges. The purlins they support are 6¼ inches wide and 2¾ inches deep, on 3-foot 9-inch centers. They in turn support the roof sheets which are riveted together with aluminum rivets 5/16 inch in diameter at a 3-inch pitch. The sheets are lap-jointed and sealed watertight with mastic.

Allowance is made in the design for relative movement, between sheeting and purlins, over a temperature range of 40 degrees between the sheeting and the supporting framework.

The ring which supports the dome is a box girder divided into 24 segments, each about 45 feet long. It was delivered to the site in those lengths and the joints were made by butt-welding the ends of the plates. A ring gutter was formed in the top of this box girder, and access manholes were provided so the drainage system could be attended to.

The tubular struts which support the

*(Concluded on next page)*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THE RIDGE TOOL CO. • ELYRIA, OHIO

## Aluminum Dome Is Biggest Ever Raised

*(Continued from preceding page)*

ring girder are cigar-shaped. They are formed of three tubes 3 inches in diameter, 2½ feet apart at the center of the strut but joined at top and bottom. They form a continuous row of triangles around the base of the structure. As they are pin-jointed at top and bottom, the aluminum dome can contract and expand yet always be held symmetrically against wind pressure. The struts on the sides parallel with the wind direction are triangulated against it.

### Erection

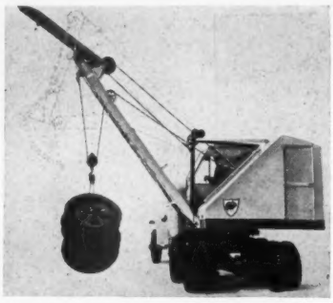
When the galleries and drum wall were completed, a scaffolding was erected around the periphery to support the ring-girder sections. These were welded together and the tubular struts were fixed in place. Then the scaffolding was removed.

Scaffolding towers were next erected on the floor of the building beneath each point of intersection of the main ribs. The ribs were placed; then, operating from the ribs, workmen erected the intermediate rafters, purlins, and sheeting.

### Race With Time, Weather

Messrs. Freeman, Fox & Partners were the consulting engineers appointed by the Government. Throughout construction the weather was bad and the site was a sea of mud. Extra labor had to be called in and round-the-clock shifts had to be instituted to complete the structure in time for the May opening of the Festival.

The building accommodates 5,000 people, and escalators speed their movement around the exhibits. The Dome of Discovery will be dismantled at the close of the exhibition, but it has been designed for re-erection if necessary.



**With its new crane adapter the Schield-Bantam backhoe converts to a crane hoist in 5 minutes to lower pipe, valves, etc., into a trench.**

## Adapter Makes Hoe A Three-in-One Unit

A new backhoe crane adapter developed by Schield Bantam Co., Waverly, Iowa, is reported to save considerable time in pipeline work. The company states that the truck-mounted Bantam backhoe digs 100 feet of 5-foot trench per hour; converts to a crane hoist in 5 minutes for lowering pipe, valves, etc., into the trench; and then hooks on a backfill blade to cover the trench at a rate of 350 to 400 feet per hour.

The crane adapter fits the standard ⅜-yard Bantam backhoe and uses the same boom, stick, and controls of the full-circle swing. The capacity of the crane, rated without outriggers or counterweights on the truck, is 2½ tons.

To attach the adapter to the backhoe you remove the hoe bucket, insert a 10-inch sheave near the boom tip, and re-thread two cables. The backhoe itself is available with 20, 25, or 30-inch buckets. It will dig to a depth of 14 feet. The backfill blade is 5 feet wide and 2 feet high and has a maximum reach of 23½ feet.

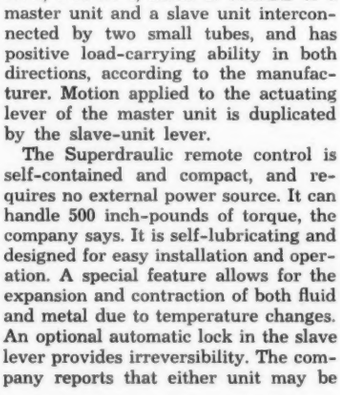
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 305.

## New Remote Control

A hydraulic remote-control system for vehicles, road-building machinery, machine tools, drill rigs, power plants, and construction equipment is offered by Superdraulic Corp., 14256 Wyoming Ave., Detroit 4, Mich. It consists of a master unit and a slave unit interconnected by two small tubes, and has positive load-carrying ability in both directions, according to the manufacturer. Motion applied to the actuating lever of the master unit is duplicated by the slave-unit lever.

The Superdraulic remote control is self-contained and compact, and requires no external power source. It can handle 500 inch-pounds of torque, the company says. It is self-lubricating and designed for easy installation and operation. A special feature allows for the expansion and contraction of both fluid and metal due to temperature changes. An optional automatic lock in the slave lever provides irreversibility. The company reports that either unit may be mounted in stationary or movable positions without affecting the operation of the system.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 321.



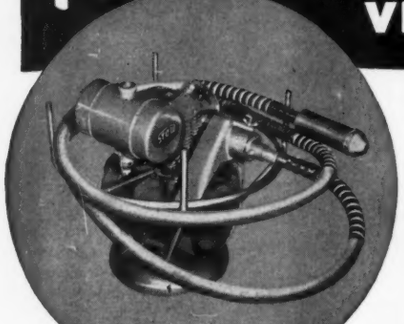

**A movement in either direction of the hand lever on the master cylinder of the Superdraulic remote control is duplicated by the slave unit lever.**

## Data on Portable Roller

A 6-page brochure on the new portable Galion roller is available from The Galion Iron Works & Mfg. Co., Galion, Ohio. It points out that the roller may be used for compacting all kinds of blacktop and loose materials. Complete specifications are given, together with detailed descriptions and photos of construction and operation features such as hydraulic steering, constant-mesh transmission, spur-gear final drive, variable-weight compression roll, towing hitch with built-in hydraulic jack, and a 25-hp 4-cylinder Wisconsin air-cooled gasoline engine.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 351.


New! A COMPLETE LINE OF STOW GASOLINE AND ELECTRIC VIBRATORS



**SUPERIOR PERFORMANCE** — thru improved design; higher operating speeds; lighter weight, heavy duty flexible shafting; shorter, more efficient vibrator heads.

**MORE UTILITY** — new STOW design permits tool shafts to be quickly, easily attached to the engine shaft for grinding, buffing, drilling. Complete accessories available.

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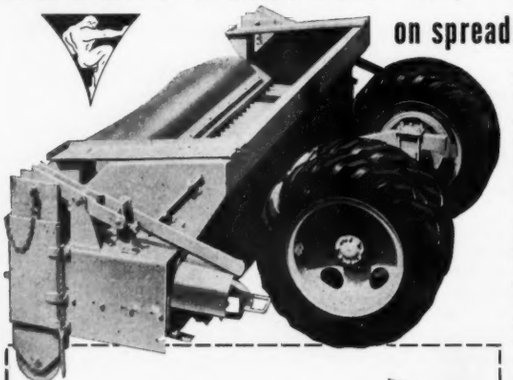
Catalogs all STOW vibrator models and accessories. Gives performance data. Write today for your FREE copy

STOW MANUFACTURING CO.
40 SHEAR STREET BINGHAMTON, N. Y.

BOOSTS PROFITS $99.60 per hour on spreading of cement



Hercules Cement Spreader couples to any conventional dump truck, spreads bulk cement evenly in exact amounts desired over widths up to 10 feet at single pass. Two-man crew. During spreading operation (traveling 30 ft. per minute) this unit saves you 2c to 5c per sq. yd. in time, labor, and materials—or $99.60 per hour.

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Hercules STEEL PRODUCTS CORPORATION, Galion, Ohio DEPT. 705

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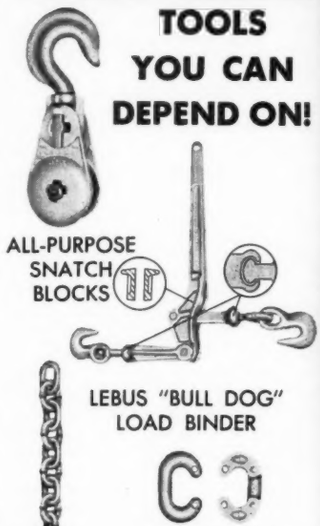


All LeBus Tools are designed by capable engineers and drop forged from alloy and high carbon steels in one of the most modern die-making and forging plants in the country. These tools are given a full pull strength test before they leave the plant, which guarantees these units against failure in the most rugged service.

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## New One-Yard Loader With Hydro Controls

A hydraulically controlled bucket loader designed for mounting on Minneapolis-Moline or Case tractors is manufactured by Reese Engineering Co., 4441 Santa Fe Ave., Los Angeles 58, Calif. It is available with buckets of ¾ or 1-cubic-yard capacities and it has a dumping height of 7 feet 8 inches with the lip of the bucket at the full 50-degree dump angle.

One handle operates both the lifting arms and the bucket control mechanism. The lifting arms are controlled by the fore and aft motion, and the bucket by the sidewise motion. The hoist valve provides a float position as well as a powered up and down motion to simplify loading and dozing operations. A bucket position indicator shows at a glance the angle of tilt or dump. The loader may be fitted with a fork-lift attachment, a jib boom, or a backfill blade.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 269.

This one-yard hydraulically-controlled bucket loader is made by Reese Engineering Co. for mounting on Minneapolis-Modine or Case tractors.

## Safety-Products Catalog

A new 70-page catalog is designed as a guide to the selection and requisition of over 500 different safety accessories and devices. It is available from Parker Safety Equipment Co., 785 Lyons Ave., Irvington 11, N. J. The products described and illustrated include goggles, eye shields, face shields, gloves, safety hats, welding curtains, tarpaulins, rubber boots, oilskin clothing, welding cable, welding helmets, and cutting torches.

This literature may be obtained from the company by requesting Handbook No. 12 or by using the Request Card at page 16. Circle No. 343.

## Air Placement Moves

The Air Placement Equipment Co. has moved into new quarters at 1009-11 W. 24th St., Kansas City, Mo., in order to expand its office, shipping, and warehousing facilities. It chose a Butler steel building for the new quarters, and finished it on the interior with vermiculite concrete and acoustical plaster applied by the Bondact process. This process uses the Bondactor, a product made by Air Placement Equipment Co. for the air-placement of concrete and other materials.

## Data on Speed Reducers Used in Operating Bridges

The use of Earle speed reducers in the operation of movable bridge machinery is described in a 16-page catalog available from Earle Gear & Machine Co., 4711 Stenton Ave., Philadelphia 44, Pa. These reducers, the literature points out, are compact, self-contained, and fully enclosed. They are designed to operate under all weather conditions. Automatic lubrication and broad bearing surfaces on the gears help reduce wear, the company says.

The speed reducers are made in many sizes and types to cover all ordinary requirements. When special designs are necessary because of unusual conditions, Earle staff engineering services are available. Data in the catalog include specifications of the units, service factors, horsepower ratings, dimensions, and photographs of installations. Additional data are given on the Earle gasoline power units for operating movable bridges and other massive machinery.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 290.

## Small Air-Cooled Engines

A folder describing three air-cooled engines which have a power range of 1.5 through 6.0 hp is offered by Cushman Motor Works, Inc., Lincoln, Nebr. The engines are designed for powering generator sets, small tractors, compressors, sprayers, concrete mixers, conveyors, and other equipment. Detailed specifications, illustrations, and an outline of the unit's principal features are included in the catalog.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 295.


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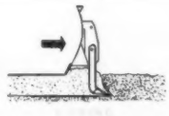

The 4 shanks, capped with lock-on teeth, rip the ground when tractor is backing up. Blade acts as depth gauge.

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Preco Back-Rippers have been in use for the past three years by many well-known contracting firms. They save time and have replaced other equipment in building pioneer roads, clearing land and rights-of-way, in gravel pit operations, slate breaking in coal strip mines, mounted on pusher tractors for scraper loading, for logging operations and many other uses. Quickly installed on most straight blade bulldozers.

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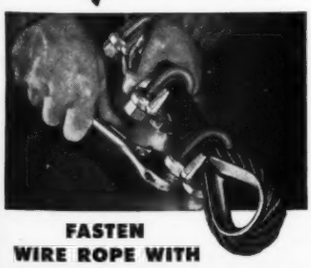

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The Hopto TM hydraulic crane mounts on all standard automotive trucks of 1½ tons or larger. Its maximum lifting height is 23 feet.

## New Hydraulic Crane

A hydraulic crane for mounting on standard trucks has been announced by Badger Machine Co., 1122 W. 5th St., Winona, Minn. The hoist, boom, and 180-degree swing of the Hopto TM may be hydraulically operated from the truck power takeoff or an independent motor.

Weighing 2,200 pounds, the new unit can be mounted on all standard automotive trucks of 1½ tons or larger. It is designed for a lift capacity of 1,500 pounds at a 15-foot radius; use of stabilizers will permit lifting larger loads. The maximum lifting height is 23 feet. Vickers and Blackhawk equipment is used in the hydraulic system. The company points out that the Hopto TM is designed for operation without the use of drums, clutches, brakes, etc.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 312.

## Offers Soil-Survey Service

A 4-page bulletin explains geophysical exploration service for solving construction and tunneling problems which is offered by Fisher Research Laboratory, Inc., 1961 University Ave., Palo Alto, Calif. This contract service includes refraction seismograph, magnetometer, and electrical resistivity surveys.

The literature outlines the uses to which the surveys can be put in engineering and construction. The foremost of these are to determine bedrock and the nature of surface materials, trace buried placer channels, map the depth of overburden, and locate material supplies. Survey methods are described and illustrated.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 337.

## Floor-Grating Catalog

An 8-page brochure describes three types of floor gratings available in steel, aluminum, stainless steel, and other alloys. It is available from Borden Metal Products Co., P. O. Box 172, Elizabeth, N. J. The gratings may be obtained in all-welded, pressure-locked, and riveted types.

The catalog indicates the features of Borden products, tells how to order them, describes the company's planning and checking service, illustrates types and sizes, and gives tables of safe load capacity.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 318.


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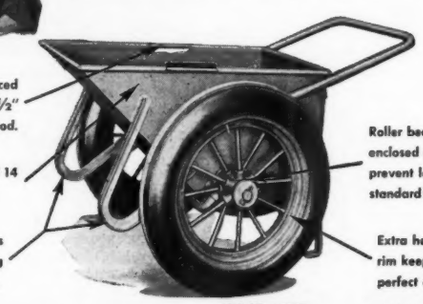
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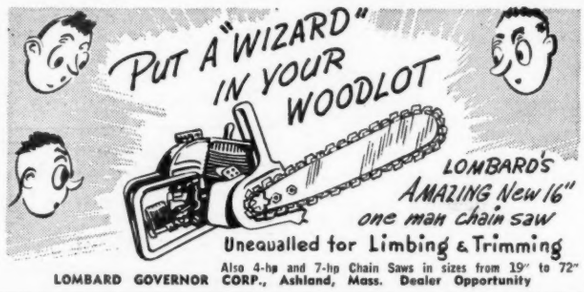


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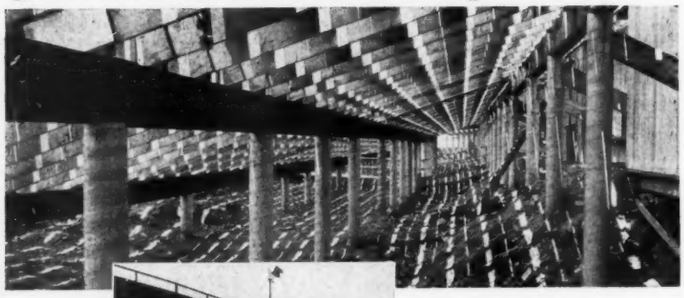

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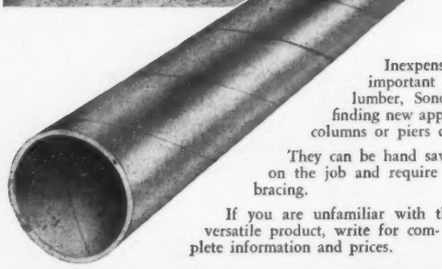

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## *Two years ago*

C. W. Frysinger, Columbus, Ohio contractor, bought a high-speed, rubber-tired D Roadster Tournapull especially for finishing sub-grade, berms and back-slopes on a 10-mile, 178,000-yd. stretch of U. S. Hwy. 30N in Crawford and Wyandot Counties. Put to work self-loading around poles and culverts, the small, versatile Roadster averaged 50 pay yards of topsoil, sand and silt hourly on 1200-ft., one-way hauls through traffic. "It did a first rate job," reports Mr. Frysinger.

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